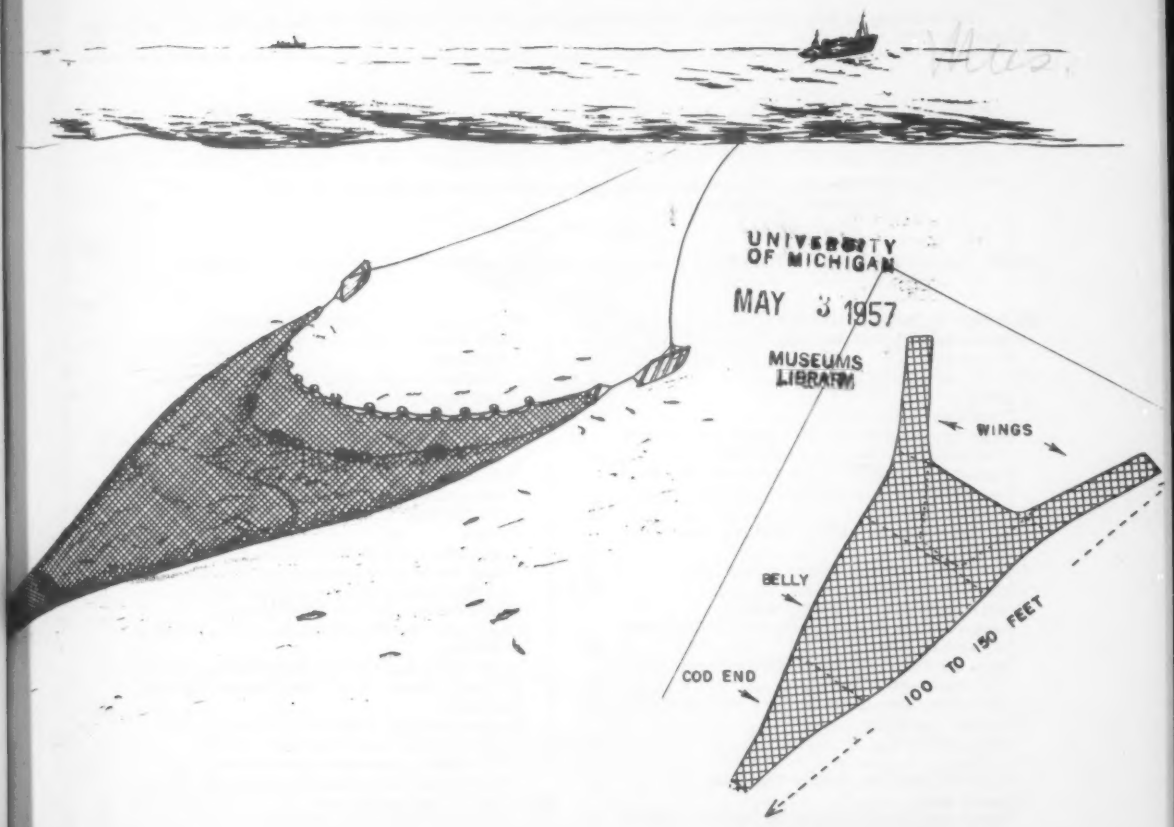
COMMERCIAL FISHERIES REVIEW



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FISH AND WILDLIFE SERVICE

COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

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Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

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COMMERCIAL FISHERIES REVIEW

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BOTTOM TRAWLING EXPLORATION IN THE STRAIT OF JUAN DE FUCA--FEBRUARY TO MARCH 1956

By Melvin R. Greenwood*

SUMMARY

Bottom fish exploration in the Strait of Juan de Fuca was carried out during February and March 1956 by the U. S. Fish and Wildlife Service's exploratory fishing vessel John N. Cobb. The rough bottom of the Strait caused considerable gear damage, especially in the western part, but some clear trawling areas were found. Results were generally poor from a commercial fishing standpoint with noncommercial fish, mostly dogfish and ratfish, dominating the catches in all areas. Some fair showings of lingcod and true cod were found, with smaller catches of rockfish and flatfish. Four species of commercial shrimp were caught over a large area in beam trawls, but only in small quantities. Winter weather conditions did not seriously interfere with the fishing operations.

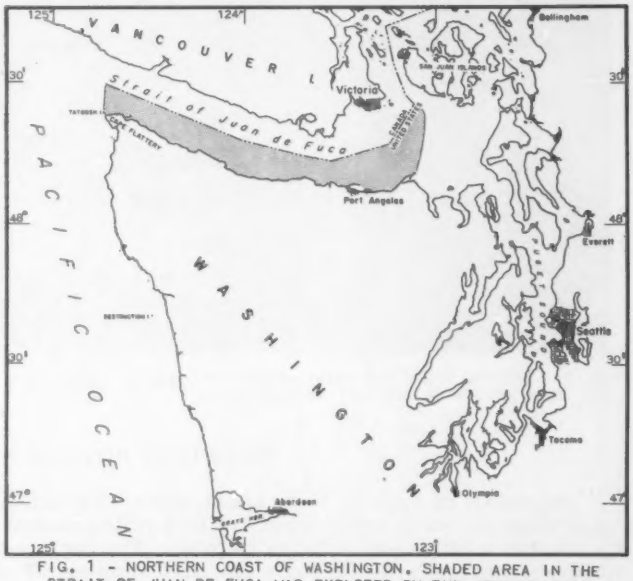

FIG. 1 - NORTHERN COAST OF WASHINGTON. SHADED AREA IN THE STRAIT OF JUAN DE FUCA WAS EXPLORED BY THE JOHN N. COBB.

INTRODUCTION

The Service's exploratory fishing vessel John N. Cobb explored with bottom trawls the United States side of the Strait of Juan de Fuca, from February 15 to March 9, 1956. Objectives were to determine the trawlability of the bottom and to determine species and quantities of bottom fish available to commercial fishing methods at that time of year.

Limited trawling had been carried out in certain parts of the Strait in the past, but this was the first attempt at systematic coverage. Past experience of commercial fishermen indicated that the Strait was generally hazardous for trawling, especially in the western reaches; however, the exact extent of trawlable bottom was not known. If some productive trawling ground was found in the Strait it could be used, especially by the smaller vessels, during periods of bad weather on the offshore grounds or to "top off" a trip on the way home.

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GEAR USED

A standard 400-mesh western otter trawl with a $4\frac{1}{2}$-inch stretched-mesh cod end was used on all drags for bottom fish. (Specifications for this trawl are described by Alverson 1951.)

A 20-foot beam trawl with bags of 36-thread $1\frac{1}{2}$-inch mesh and 15-thread $1\frac{1}{4}$-inch mesh cotton webbing, 150 meshes deep, was used for shrimp. (Details of the beam trawl are described by Ellson and Livingstone 1952.)

FIG. 2 - MENDING THE OTTER TRAWL ABOARD THE JOHN N. COBB WAS A FREQUENT CHORE, RESULTING FROM THE ROUGH BOTTOM IN MUCH OF THE STRAIT.

TRAWLING BOTTOM

The Strait of Juan de Fuca spans some 70 miles from end to end, and the United States side varies in width from 4.5 to 8 miles, except the eastern part which spreads out into Haro Strait and Admiralty Inlet. The bottom cross-sectional profile is roughly U-shaped with the slope usually dropping off rather abruptly to 50 or 60 fathoms (100 fathoms in the western end) and then more gradually to the greatest depths. As a result, nearly all drags were made in water over 50 fathoms deep. The greatest depths in the strait range from about 155 fathoms at the western end to about 70 fathoms north of Green Point. North of Dungeness Spit the water again deepens to about 95 fathoms.

The bottom of the well-traveled Strait was found to be strewn with debris. Among items commonly picked up in the otter trawl were clinkers, old tires, discarded vessel fittings, and pieces of water-soaked wood of various sizes. Bottom samples taken with a snapper-type sampler in connection with the fishing operations showed considerable variation in bottom types, even within relatively contained areas. Mud, sand, gravel, shell, stone and rocky bottom areas were widespread.

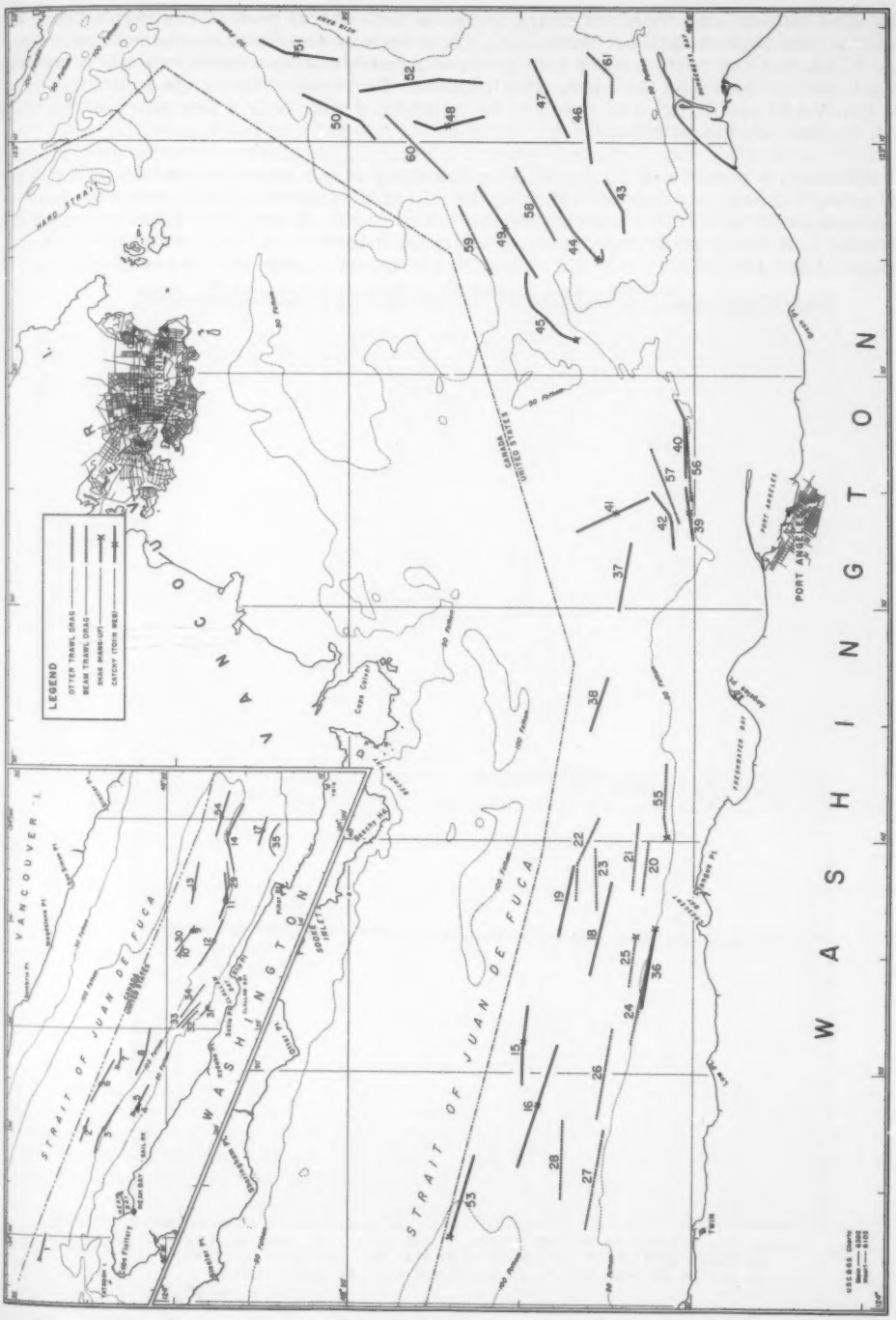

FIG. 3 - LOCATION OF OTTER-TRAWL DRAGS AND BEAM-TRAWL DRAGS IN THE STRAIT OF JUAN DE FUCA.

Most mud bottom was found on drags made in the central part of the Strait from Kydaka Point to Port Angeles. Sand and gravel bottom was not uncommon west of Kydaka Point, but the bottom here was generally harder with considerable outcroppings of rock and boulders on the steep side slopes. The bottom on drags in the extreme eastern end of the Strait was found to be quite hard with only a few samples showing sand, gravel, shell and stones.

Although a number of likely-looking trawling areas were located on navigational charts, subsequent examination with the aid of a recording depth sounder revealed the majority to be unsuitable for otter-trawl gear. Even after careful analysis of charts and depth-sounding records, out of 38 otter-trawl drags only 12 came through absolutely clear. On the remainder some damage to the net occurred.

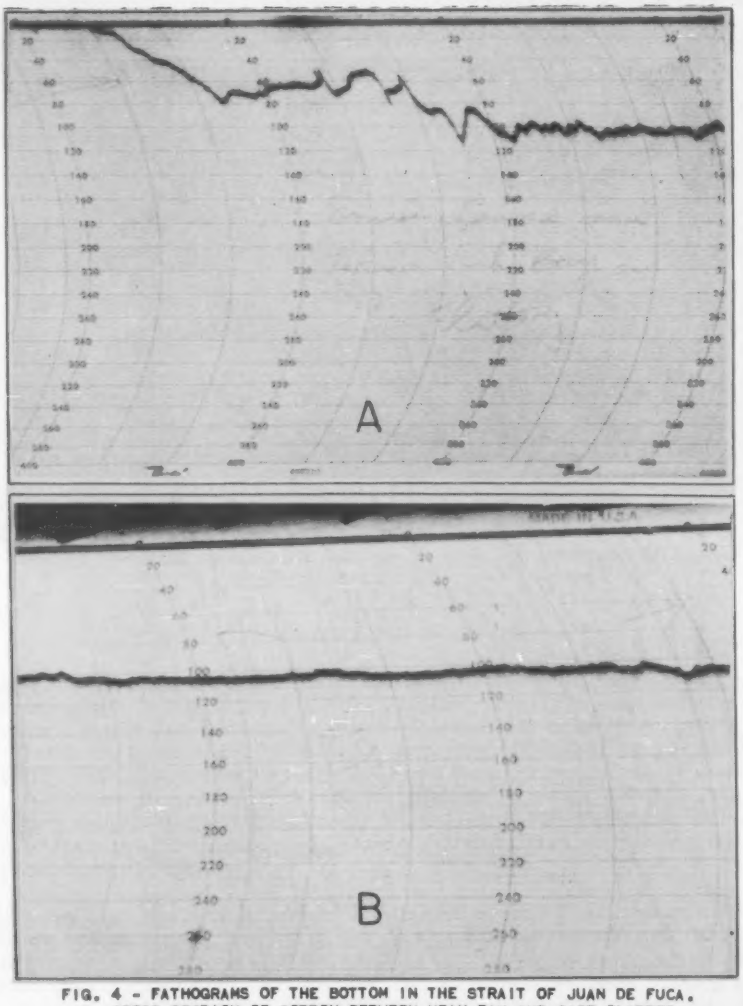

FIG. 4 - FATHOGRAMS OF THE BOTTOM IN THE STRAIT OF JUAN DE FUCA.
A. CROSS-SECTION OF BOTTOM BETWEEN NEAH BAY AND CAPE FLATTERY.
B. BOTTOM ON DRAG NO. 3, IN WHICH THE NET WAS BADLY TORN.

Drag number 8 made in 112 to 118 fathoms north of Kydaka Point was the only otter-trawl drag out of 16 made west of Twin to come through completely clear. However, five of the drags made from Slip Point to Pillar Point in 54 to 96 fathoms came through with relatively minor damage to the net (see fig. 3 and table 1).

East of Twin, 4 out of 22 otter-trawl drags resulted in severe damage to the net. Seven others tore-up slightly, and 11 came through clear. While no particular section in this area can be declared absolutely free from snags and obstructions, the safest part appears to be from Twin to Port Angeles, where six drags made in 72 to 91 fathoms and four drags made in 44 to 74 fathoms suffered little or no gear damage. The "pocket" lying between Green Point, Dungeness Spit, and Hein Bank is relatively free from serious obstacles except near the end of the submarine ridge that extends north from Green Point where two drags hung up.

FIG. 5 - EMPTYING THE COD END ON DECK OF THE JOHN N. COBB. MOSTLY BOTTOM DEBRIS AND NONCOMMERCIAL FISH WERE TAKEN IN THIS DRAG.

A total of 23 beam-trawl drags made at depths from 49 to 118 fathoms from Kydaka Point to Hein Bank indicate that much of the bottom is satisfactory for this type of gear. The only two drags that resulted in considerable damage to the beam trawl were made within the 57- to 68-fathom depth range a short distance off Tongue Point.

FISHING RESULTS

In general, from a commercial fisheries viewpoint, fishing results were poor. Although several species of fish having commercial value were taken throughout the area, noncommercial fish (including ratfish, dogfish, skates, and arrow-toothed flounder or turbot) dominated the otter-trawl catches. Shrimp were present, but were not found in commercial quantities. Detailed results of otter-trawl and beam-trawl drags are tabulated in tables 1 and 2.

The fact that some clear trawling bottom was found in various parts of the Strait and that several kinds of marketable trawl fish were present could mean that at

other times of the year profitable fishing might be found there. This is true of other trawling grounds where the abundance of the fish varies seasonally.

NONCOMMERCIAL FISH: Noncommercial fish were taken in amounts from 150 to to 4,390 pounds per one-hour drag 1/ and the majority of drags took over 950 pounds each. The largest catch included 2,300 pounds of ratfish and 2,000 pounds of dogfish taken in drag number 18 off Crescent Bay in 76 to 81 fathoms. The largest

FIG. 6 - NONCOMMERCIAL FISH DOMINATED MOST OF THE CATCHES. THIS CATCH WAS PREDOMINANTLY DOGFISH, RATFISH, AND SKATES.

catch of turbot or arrow-toothed flounder (500 pounds) was taken in drag number 37 off Port Angeles in 72 to 76 fathoms, and the best catch of skate (600 pounds) was in drag number 40 in 44 to 51 fathoms also off Port Angeles.

FOOD FISH: Lingcod and true cod were caught in many of the drags and were the dominant food fish taken throughout the entire area. Except for these and rockfish, no other species of food fish was taken in amounts greater than 35 pounds per drag.

Lingcod: The best catch of lingcod, 335 pounds, was taken in drag number 8 off Kydaka Point in 112 to 118 fathoms. The next largest catch, 248 pounds, was in drag number 50 off Hein Bank in 56 to 66 fathoms. Two other drags caught 75 pounds of lingcod off Sail Rock in 101 to 109 fathoms and off Hein Bank in 70 to 79 fathoms. Lingcod were taken in 17 other drags in amounts of 45 pounds or less.

True cod: The best catch of true cod, 400 pounds, was made in drag number 37 off Port Angeles in 72 to 76 fathoms; 60 to 70 pounds of marketable size true cod were taken in four other drags off Sail Rock, off Slip Point and off Port Angeles.

Flatfish: Several species of flatfish were found distributed throughout the Strait, but they were caught only in small numbers. No single species, except halibut, was taken in amounts greater than 7 pounds per drag. Miscellaneous flatfish caught included Dover sole, English sole, petrale sole, flathead sole, rex sole, rock sole, and sand sole.

1/ DRAGS SUSTAINING SERIOUS GEAR DAMAGE NOT INCLUDED.

Rockfish: A total of 150 pounds of black rockfish were taken in drag number 3 off Sail Rock in 101 to 109 fathoms. The second best catch, 100 pounds, was in drag number 15 off Low Point in 81 to 85 fathoms. Pacific ocean perch were present in 10 drags in amounts of 15 pounds or less, and in two drags in amounts of 25 pounds and 70 pounds. Other species of red rockfish were taken in small numbers.

Shrimp: Four species of commercial shrimp were caught in small quantities with the beam trawl. Up to 30 pounds of 132-count 2/ pink shrimp, 7 pounds of 40-count side-stripe shrimp, 2½ pounds of 46-count spot shrimp, and trace amounts of coon-stripe shrimp were taken per one-hour beam-trawl drag. All four species were found in all areas covered between Kydaka Point and Hein Bank. The best catch of pink and side-stripe shrimp were made between Twin and Freshwater Bay at depths from 57 to 76 fathoms where the bottom consists generally of mud, sand, and gravel.

FIG. 7 - A BEAM-TRAWL CATCH OF SIDE-STRIPE SHRIMP IS WEIGHED AND COUNTED. ALTHOUGH SHRIMP WERE WIDESPREAD, THEY WERE TAKEN ONLY IN SMALL QUANTITIES.

WEATHER CONDITIONS

This survey was carried out during the winter, and the weather conditions were about normal for the season. Air temperatures recorded at the start of each drag ranged from 28° F. to 47° F. and averaged 39° F. Wind velocities as high as 40 knots and precipitation in the form of rain, snow, and sleet were experienced during actual dragging operations. With the exception of the last day of fishing, however, the seas were calm to moderate. The wind, even though strong at times, changed direction frequently which did not give the seas time to build up. Fishing activities were halted on only one day when gusts of wind up to 55 knots swept the strait.

LIST OF COMMON AND SCIENTIFIC NAMES OF FISH AND SHRIMP CAUGHT DURING BOTTOM TRAWLING EXPLORATION IN THE STRAIT OF JUAN DE FUCA--1956

FLAT FISH:	
SOLE:	
DOVER	MICROSTOMUS PACIFICUS
ENGLISH	PAROPHRYS VETULUS
FLATHEAD	HIPPOGLOSSOIDES ELASSODON
PETRALE	EOPSETTA JORDANI
REX	GLYPTOCEPHALUS ZACHIRUS
ROCK	LEPIDOPSETTA BILINEATA
SAND	PSETTICHTHYS MELANOSTICTUS
HALIBUT	HIPPOGLOSSUS STENOLEPIS
ARROW-TOOTHED FLOUNDER (TURBOT)	ATHERESTHES STOMIAS
ROUND FISH:	
HAKE	MERLUCCIUS PRODUCTUS
LINGCOD	OPHIODON ELONGATUS
POLLOCK	THERAGRA CHALCOGRAMMA
SABLEFISH (BLACK COD)	ANOPLOPOMA FIMBRIA
TRUE COD (GREY COD)	GADUS MACROCEPHALUS

ROCKFISH:	
BLACK: ORANGE-SPOTTED	SEBASTODES MALIGER
YELLOW-TAILED	SEBASTODES FLAVIDUS
PACIFIC OCEAN PERCH	SEBASTODES ALUTUS
RED: BLACK-MOUTHED	SEBASTODES CRAMERI
GREEN-STRIPED	SEBASTODES ELONGATUS
ORANGE	SEBASTODES PINNIGER
OTHER:	
DOGFISH	SQUALUS SUCKLEYI
RATFISH	HYDROLAGUS COLLIEI
SKATE: BIG	RAJA BINOCULATA
LONG-NOSED	RAJA RHINA
PRICKLY	RAJA STELLULATA
SHRIMP:	
COON-STRIPE	PANDALUS HYPSINOTUS
PINK	PANDALUS JORDANI
SIDE-STRIPE	PANDALOPSIS DISPAR
SPORT	PANDALUS PLATYCEROS

2/NUMBER OF HEADS-ON SHRIMP PER POUND.

TABLE 1 - OTTER TRAWL FISHING LOG--M/V JOHN N. COBB--CRUISE 25--STRAIT OF JUAN DE FUCA (FEBRUARY-MARCH 1956)

Area	Tatoosh Island to Sydaks Point								Sydaks Point to Twin							
Drag Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	18
Date	2/16/56	2/16/56	2/17/56	2/17/56	2/17/56	2/18/56	2/18/56	2/18/56	2/19/56	2/19/56	2/19/56	2/19/56	2/20/56	2/20/56	2/21/56	2/21/56
Latitude N, Longitude W,	48°27.8' 124°39.8'	48°26.5' 124°30.8'	48°23.0' 124°27.3'	48°21.7' 124°27.2'	48°21.1' 124°25.3'	48°23.3' 124°23.0'	48°22.9' 124°21.9'	48°21.1' 124°20.6'	48°18.2' 124°10.2'	48°18.9' 124°12.2'	48°16.3' 124°05.1'	48°16.3' 124°09.6'	48°17.9' 124°04.2'	48°15.1' 123°58.6'	48°15.5' 123°59.7'	48°16.0' 123°57.3'
Course, magnetic 1/	266°	088°	271°	270°	275°	276°	256°	264°	270°	270°	252°	274°	266°	256°	270°	264°
Depth range in fathoms	134-148	128-131	101-109	48-59	62-68	119-127	120-129	112-118	109-110	111-115	100-104	97-101	102-105	98-99	57-62	98-102
Type of bottom	G. & Hrd.	---	S. & rky.	rky.	---	Rids.	---	gr. M.	gn.M.S.& St.	St.	St. & M.	---	---	M.S.& G.	---	gn.S. & Sh.
Trawling bottom	Snag	Snag	Catchy	Snag	Snag	Catchy	Snag	Clear	Snag	Snag	Catchy	Catchy	Catchy	Catchy	Catchy	Catchy
Time on bottom in minutes	30	30	60	8	30	60	17	60	5	8	60	60	60	60	30	60
Remarks	Bad tear	Slight tear	Bad tear	Broke D.O. 2/	Broke D.O.	Bad tear	Bad tear	---	Mod. tear	Bad tear	Slight tear	Slight tear	Bad tear	Slight tear	Slight tear	Slight tear
Estimated total catch in pounds	300	75	1500	30	1000	1350	120	2200	60	70	1250	1100	1050	990	700	1500
Catch in pounds (% marketable):																
Flat Fish																
Dover	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
English	Trace 3/	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Trace
Flathead	---	---	Trace	---	---	---	---	---	---	---	Trace	---	---	---	---	---
Halibut	---	---	---	---	---	---	---	---	---	---	Trace	---	---	Trace	---	---
Petrale	---	---	---	---	Trace	---	---	---	---	---	---	---	---	---	---	---
Sea	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Trace	---
Rock	---	---	---	---	---	---	---	---	---	---	Trace	Trace	Trace	---	---	Trace
Sand	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Turbot	30	Trace	20	Trace	Trace	50	Trace	50	---	Trace	80	130	70	55	30	250
Round Fish																
Hake	---	---	---	---	---	---	---	Trace	---	---	---	Trace	---	---	---	---
Lingcod	Trace	Trace	75(100%)	---	20(100%)	20(80%)	---	335(98%)	---	---	---	20(100%)	20(80%)	Trace	---	---
Pollock	Trace	Trace	---	Trace	Trace	Trace	---	20	---	---	Trace	30	Trace	Trace	---	60
Sablefish	---	---	---	---	Trace	Trace	---	---	---	---	---	---	Trace	---	---	Trace
True cod	Trace	---	100(70%)	Trace	30(50%)	Trace	---	40(50%)	---	---	50(50%)	125(70%)	Trace	70(50%)	Trace	75(75%)
Rock Fish																
Black	---	---	150(100%)	---	---	Trace	---	---	---	---	---	---	---	---	---	---
Pacific ocean perch	Trace	---	---	---	---	25(100%)	---	---	---	Trace	80(100%)	60(100%)	---	---	Trace	---
Red	Trace	Trace	Trace	Trace	25(80%)	Trace	---	25(100%)	---	---	20(100%)	Trace	70(100%)	Trace	---	Trace
Other													20(100%)		Trace	Trace
Dogfish	20;	---	500	Trace	325	400	60	300	---	Trace	450	600	165	350	30	485
Ratfish	220	35	600	Trace	570	800	50	1070	Trace	40	400	100	650	450	600	525
Skate	---	Trace	30	---	20	Trace	---	350	Trace	Trace	20	---	30	35	Trace	60

Area	Twin to Freshwater Bay						Freshwater Bay to Green Point						Green Point-Dungeness Spit to Main Bank											
Drag Number	15	16	18	19	36	53	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Date	2/21/56	2/21/56	2/22/56	2/22/56	2/28/56	3/6/56	2/28/56	2/29/56	2/29/56	2/29/56	3/1/56	3/1/56	3/1/56	3/2/56	3/2/56	3/3/56	3/3/56	3/3/56	3/3/56	3/3/56	3/5/56	3/5/56
Latitude N, Longitude W,	48°15.3' 123°17.1'	48°13.9' 123°18.8'	48°12.4' 123°21.8'	48°13.9' 123°16.1'	48°11.5' 123°17.2'	48°16.3' 123°53.0'	48°11.9' 123°27.2'	48°13.0' 123°35.3'	48°10.1' 123°27.1'	48°10.5' 123°21.1'	48°13.4' 123°26.7'	48°11.3' 123°25.1'	48°12.6' 123°11.6'	48°14.2' 123°12.2'	48°14.8' 123°15.7'	48°13.1' 123°06.9'	48°13.6' 123°09.8'	48°16.1' 123°08.9'	48°16.0' 123°11.8'	48°19.2' 123°09.5'	48°20.3' 123°06.5'	48°19.7' 123°07.8'
Course, magnetic 1/	251°	265°	260°	079°	077°	263°	257°	085°	058°	239°	131°	226°	225°	209°	208°	214°	042°	332°	219°	007°	350°	192°
Depth range in fathoms	83-85	88-90	76-81	84-91	48-50	98-101	78-76	74-80	48-52	48-51	68-74	59-62	71-78	76-90	62-73	82-88	82-88	60-64	71-74	56-66	70-79	94-80
Type of bottom	---	M.	M.S.& G.	S.	Brd.& St.	gn.S.& St.	gr.M.& St.	gr.M.S.& Sh	gr.M.S.& Sh	S.& St.	St.Sh.& Hrd	gn.S.& Sh.	Hrd.	Hrd.& G.	Hrd.& G.	Brd.	Hrd.& G.	Brd.	Hrd.& G.	Brd.	Hrd.St.& Sh	Brd.	gn.S.St.& Sh	Hrd.
Trawling bottom	Catchy	Catchy	Clear	Clear	Snag	Snag	Clear	Clear	Catchy	Clear	Catchy	Clear	Clear	Snag	Snag	Clear	Clear	Clear	Catchy	Clear	Catchy	Clear	Catchy	Clear
Time on bottom in minutes	60	60	60	60	60	60	60	60	60	60	60	60	60	87 4/	45	60	60	60	60	60	60	60	60	60
Remarks	Slight tear	Slight tear	---	---	Bad tear	Bad tear	---	---	Slight tear	---	Slight tear	---	---	Bad tear	Bad tear	---	---	Slight tear	Slight tear	---	Slight tear	---
Estimated total catch in pounds	890	900	4500	1140	600	300	2000	250	350	1800	400	600	450	300	550	2500	800	254	1300	1300	2700	750
Catch in pounds(% marketable):																						
Flat Fish																						
Dover	Trace	---	Trace	Trace	Trace	---	---	---	---	---	Trace	---	---	---	---	Trace	---	---	---	Trace	---	---
English	---	---	---	---	---	---	---	---	---	Trace	---	---	---	---	---	Trace	---	---	---	---	---	---
Flathead	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Halibut	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Petrale	Trace	Trace	Trace	---	---	---	---	---	---	---	---	---	---	---	---	---	35(100%)	---	---	---	---	---
Sea	---	---	Trace	---	---	---	---	---	---	---	Trace	---	---	---	---	---	---	---	---	Trace	---	---
Rock	---	---	---	---	---	---	---	---	---	---	---	---	---	Trace	---	Trace	Trace	Trace	---	---	Trace	Trace
Sand	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Trace	---	---
Turbot	Trace	25	70	25	Trace	135	500	---	---	---	---	---	90	30	Trace	Trace	60	20	70	Trace	Trace	Trace
Round Fish																						
Hake	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lingcod	45(95%)	85(100%)	Trace	---	---	---	40(100%)	Trace	---	20(100%)	Trace	25(100%)	---	Trace	---	---	---	---	Trace	210(93%)	75(100%)	---
Pollock	---	---	---	---	---	Trace	20	---	Trace	---	30	---	---	---	---	---	---	---	40	20	180	25
Sablefish	---	---	Trace	---	---	---	Trace	20(50%)	---	---	Trace	---	Trace	Trace	---	---	---	---	---	---	---	---
True cod	50(20%)	25(40%)	70(40%)	40(50%)	30(50%)	---	40(25%)	35(70%)	45(45%)	100(60%)	30(60%)	80(75%)	75(20%)	---	40(75%)	40(60%)	55(25%)	---	35(50%)	35(100%)	---	---
Rock Fish																						
Black	100(100%)	21(100%)	40(100%)	Trace	Trace	---	---	---	20(100%)	35(100%)	---	---	---	---	---	Trace	---	---	---	---	---	---
Pacific ocean perch	Trace	Trace	Trace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Red	---	---	---	---	---	---	---	---	Trace	Trace	---	Trace	---	---	---	---	---	---	---	---	---	---
Other																						
Dogfish	60	320	2000	950	120	100	900	100	90	300	80	25	150	125	400	1100	330	65	230	80	210	135
Ratfish	600	450	2300	100	400	25	Trace	---	---	400	80	100	100	80	60	1300	520	80	740	730	1700	410
Skate	Trace	Trace	20	20	25	---	20	40	125	600	125	300	---	30	25	---	Trace	70	140	25	50	60

1/ Course given is between starting point and end point.
2/ "Trace" -less than 20 pounds of fish.
3/ "D.O." - dandylion gear.
4/ Winch broke down when gear was hit.

G. = gravel; Brd. = hard; rky. = rocky; Rids. = boulders; gy.M. = gray mud; Gn. S. = green sand; St. = stones; Sh. = shell

TABLE 2 - BEAM TRAWL FISHING LOG--M/V JOHN N. COBB--CRUISE 25--STRAIT OF JUAN DE FUCA (FEBRUARY-MARCH 1956).

Area	Kydaka Point to Twin							Twin to Freshwater Bay				
Drag Number	29	30	31	32	33	34	35	20	21	22	23	24
Date	2/25/56	2/25/56	2/25/56	2/25/56	2/25/56	2/26/56	2/26/56	2/23/56	2/23/56	2/23/56	2/23/56	2/23/56
Latitude N.	48°16.2'	48°18.4'	48°17.2'	48°17.9'	48°17.8'	48°17.6'	48°12.8'	48°11.3'	48°11.8'	48°12.8'	48°12.8'	48°11.1'
Longitude W.	124°04.0'	124°10.8'	124°17.5'	124°18.3'	124°17.5'	124°15.8'	124°00.5'	123°40.1'	123°42.1'	123°40.9'	123°43.0'	123°43.8'
Course, magnetic 1/	251°	287°	285°	288°	290°	282°	254°	253°	078°	262°	065°	254°
Depth range in fathoms	100-102	112-118	49-52	59-66	73-77	84-88	71-83	63-71	68-75	83-90	50-56	48-53
Type of bottom	G.	gn. S.	S.G.& Sh.	S.G.& Sh.	S. & G.	M. & S.	S. & G.	M.S.& G.	S. & G.	M.S.& G.	M. & S.	M. & S.
Trawling bottom	Clear	Clear	Catchy	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Time on bottom in minutes	60	60	60	60	60	60	60	60	60	60	60	60
Shrimp catch in pounds (whole shrimp per pound):												
Pink	Trace	Trace	Trace	Trace	Trace	1½(110)	Trace	9½(125)	12(107)	Trace	Trace	1½(108)
Side-stripe	Trace	Trace	3(38)	3½(38)	1(45)	Trace	1¼(37)	1 3/4 (44)	6(47)	3¼(43)	1(52)	1(52)
Coon-stripe	-	Trace	Trace	Trace	Trace	Trace	-	Trace	Trace	Trace	Trace	-
Spot	-	Trace	Trace	Trace	2½(46)	Trace	-	-	-	-	-	-
Total Shrimp catch in pounds	1	Trace	3½	3½	4	2½	1½	11¼	18	4	2	2½
Remarks	-	-	Slight tear	-	-	-	-	-	-	-	-	-

Area	Twin to Freshwater Bay (contd.)					Freshwater Bay to Green Point		Green Point-Dungeness Spit to Hein Bank			
Drag Number	25	26	27	28	55	56	57	58	59	60	61
Date	2/24/56	2/24/56	2/24/56	2/24/56	3/1/56	3/8/56	3/8/56	3/8/56	3/8/56	3/8/56	3/8/56
Latitude N.	48°11.9'	48°12.8'	48°13.1'	48°13.7'	48°10.8'	48°10.3'	48°11.2'	48°15.1'	48°16.8'	48°13.9'	48°13.2'
Longitude W.	123°46.3'	123°51.9'	123°56.7'	123°52.0'	123°36.7'	123°22.2'	123°23.2'	123°11.1'	123°12.7'	123°08.8'	123°06.0'
Course, magnetic 1/	075°	076°	076°	218°	216°	213°	226°	218°	221°	202°	217°
Depth range in fathoms	57-65	66-76	58-65	87-99	58-68	48-52	57-61	77-84	56-68	61-63	57-76
Type of bottom	M.S.& G.	M.S.& G.	M.S.& Sh.	S. & G.	gn.M.& St.	gn.S.G.& Sh.	gn.S.& Sh.	gn.S.&St.	gn.S.St.& Sh.	gn.S.St.& Sh.	gn.S. & Hrd.
Trawling bottom	Snag	Clear	Clear	Clear	Snag	Clear	Clear	Clear	Clear	Clear	Clear
Time on bottom in minutes	56	60	60	60	60	60	60	60	60	60	45 2/
Shrimp catch in pounds (whole shrimp per pound):											
Pink	10½(125)	21½(150)	30(132)	Trace	Trace	Trace	Trace	Trace	5(171)	1½(166)	Trace
Side-stripe	7(40)	2 3/4(50)	1¼(31)	1 3/4(49)	1½(54)	Trace	Trace	Trace	1½(31)	1¼(48)	Trace
Coon-stripe	Trace	Trace	Trace	Trace	-	-	Trace	Trace	-	Trace	-
Spot	Trace	Trace	Trace	Trace	Trace	Trace	-	Trace	Trace	Trace	Trace
Total Shrimp catch in pounds	18½	21½	32	2	2½	Trace	Trace	Trace	7	3	1
Remarks	Hung up	-	-	-	Broke beam	-	-	-	-	-	-

1/ Course given is between starting point and end point.
2/ "Trace" - less than 1 pound of shrimp.
3/ Hauled trawl in before hour was up because unexpected steep slope appeared on depth sounder.

G. = gravel
gn.S. = green sand
Sh. = shell
M. = mud
St. = stones
Hrd. = hard

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HADDOCK FILLETS ARE NUTRITIOUS

Easy to handle and quick to cook, haddock fillets are a good choice for the protein part of any meal, according to the U. S. Fish and Wildlife Service. They are versatile enough for company dinners or the simplest family fare.

Cooked without the addition of fat, haddock fillets are an excellent choice for weight-conscious persons as they are a low-calorie high-protein food. When prepared with fat or served with a rich sauce, haddock fillets are equally as good in a weight-increasing diet. Haddock fillets are also a reliable source of the important B-complex vitamins--thiamine, niacin, and riboflavin as well as the important minerals--calcium, iron and iodine.

To retain the nutrients as well as insure maximum juiciness, tenderness, and general eating qualities, avoid overcooking haddock fillets. A good rule to follow is to cook only until the fish flakes easily when tested with a fork.

For a nutritious family dinner, the home economists of the U. S. Fish and Wildlife Service recommend "Haddock Fillets with Bread Stuffing."

HADDOCK FILLETS WITH BREAD STUFFING

- 2 pounds haddock fillets
- 1½ cups chopped celery
- ⅓ cup chopped onion
- ¼ cup butter or other fat, melted
- ½ teaspoon salt
- ½ teaspoon poultry seasoning
- 1¼ quarts soft bread cubes
- 2 tablespoons milk
- 1 egg, beaten
- 2 tablespoons butter or other fat, melted
- ½ teaspoon paprika
- ½ teaspoon salt

Thaw frozen fillets. Cut into serving-size portions. Cook celery and onion in butter until tender. Sprinkle salt and poultry seasoning throughout the bread cubes. Add to celery-onion mixture. Combine milk and eggs. Pour over bread cubes and mix well. Spread stuffing in a shallow, well-greased baking pan. Place fish in a single layer on stuffing. Mix butter, paprika, and salt. Cover fish with the sauce. Bake in a moderate oven, 350° F., for 30 minutes or until fish flakes easily when tested with a fork. Serve 6.

FLUORESCENCE NOT A QUALITY INDEX OF OCEAN PERCH OR HADDOCK

Fluorescence of the eyes or of the other parts of ocean perch and of haddock have, contrary to popular opinion, little, if any, relationship to the freshness of these fish, according to studies conducted at the Service's Boston Technological Laboratory.

In the studies on the ocean perch, whole fish were stored in a chilled room at 40° to 45° F. and examined regularly under ultraviolet light for fluorescence. Fifty percent of the ocean perch--while still of marketable quality--developed bright yellow fluorescence of the eyes. The eyes of the remaining ocean perch did not fluoresce, even after becoming putrid. No other signs of fluorescence that could be related to quality were detected. Thus the presence or absence of fluorescence is not a reliable index of the quality of ocean perch.

In the studies on the haddock, the fish were eviserated, stored well iced in boxes in a chilled room at 35° to 37° F., and examined frequently for fluorescence. At the initial examination, 12 percent of the haddock showed a slight yellow fluorescence of one eye. After 5 days on ice three fish were still of good quality, but the eyes of all of them were fluorescent, and about 30 percent of the eyes fluoresced very strongly. On the thirteenth day of iced storage, at which time the haddock were of borderline quality, 90 percent of the eyes fluoresced strongly. The ventral fins of more than 50 percent of the haddock developed fluorescence during storage, but the intensity of fluorescence was not marked.

At each examination, two haddock were filleted. Those of fair quality developed a bright yellow fluorescence on one or two of the four fillets examined. Fluorescence, however, was not found on all of the fillets even after they had become inedible.

The results of these tests show that fluorescence is not a reliable index of the quality of either ocean perch or haddock.

GLAZING SHRIMP

Shrimp submerged in a solution of equal parts of salt and dextrose before quick freezing have an excellent glaze, look fresh when thawed, and do not adhere to each other when frozen.

Food Field Reporter, Oct. 3, 1955.

TRENDS AND DEVELOPMENTS

California

DUNGENESS CRAB FISHERY: The crab traps were ready and final overhauls of the vessels completed by mid-November-December in preparation for the opening of the commercial dungeness crab fishery along California's north coast. Prospects were good for another successful season to match the previous year's, the best since 1951/52. In fact, it was so good that most of the Eureka and Crescent City crabbers brought in their gear with two months of the season still remaining, because some of the markets had become saturated.

A SEVEN-INCH MALE MARKET CRAB, THE HIGHLY-PRIZED DELICACY SOUGHT BY COMMERCIAL FISHING FLEETS OPERATING MOSTLY OUT OF EUREKA, CRESCENT CITY AND SAN FRANCISCO.

Landings in the San Francisco area during the 1955/56 season were above average and rocketed upwards at the Eureka-Crescent City ports. Nearly 10 million pounds of the white-meated crabs were caught in California annually during the last 10 years, bringing an income of $1.5 million per season to the vessels and fishermen alone, and providing employment for many others in allied industries.

The prime target for all this attention is the market crab, also known as the dungeness, commercial, or white crab. Only the mature males are legally caught, and along the Central California coast it usually takes 3 or 4 years to attain the legal seven-inch breadth. In a few close-to-shore areas in northern waters the crab may be taken, noncommercially only, when he reaches a width of 6.5 inches.

California crab laws and regulations apply only to this species and not to the various "rock crabs" taken in limited quantity by commercial and sport fishermen.

The introduction of more efficient crab traps (the principal means of catching the crab) and the addition of more and better-equipped fishing vessels in recent years, together with an abundant resource, are the main reasons for the continued good fishing under increasing commercial activity. But a resource that is harvested so intensively needs sound protective regulations. For 60 years the female crab has been completely protected and since 1911 it has been unlawful to take males less than seven inches in width.

In 1955 the Legislature shortened the season by two months to protect crabs during the molting season, early in the summer. The larval crabs (only as big as a grain of sand) hatch from December through March and are swept away by the ocean currents. Later they settle to the bottom and spend the rest of their lives there. During their first year they grow fast, shedding their shells from 8 to 10 times and reaching a width of 3 to 4 inches. Because the shell encases the crab tightly, it cannot grow until it sheds or molts; a crab gains from 10 to 40 percent in size during a single molt.

In 1956 the California Legislature's new regulation went into effect making it mandatory for each crab trap to have a circular escape opening at least four inches in diameter so that most females and small males can escape. This will enable them to avoid being caught and injured by handling several times each season. Such a conservation measure will help to assure a constant replenishment of the fishery, for it is only because of compliance with regulations based on sound principles of conservation that our crab resource has survived.

To learn more about crab movements, shellfish biologists have tagged several hundred of them. Most of those recovered to date have moved only a few miles from the point of release, but there were a few restless ones, too. One traveled 28 miles in a month from the mouth of the Russian River in 90 feet of water to a spot off Point Reyes in water 204 feet deep.

Another crawled 35 miles from Point Reyes to just south of San Francisco in 10 weeks. En route both were successful in eluding their principal enemy, the octopus, which finds crabmeat one of its favorite meals. Against most other marine life, the crab's powerful claws and hard shell are ample protection.

Commercial crab fishing in California is carried on from Point Conception northward, but principally off Eureka, Crescent City, and San Francisco. Other centers are in the Fort Bragg, Bodega Bay, Monterey, and Avila-Morro Bay areas. During the season the traps set from 25-300 feet deep and marked by a line of buoys, may extend for miles off these fishing sites. The traps are circular, three feet in diameter and 18 inches high, made of reinforcing steel rods covered with stainless steel wire mesh. There are two entrance tunnels opposite each other and a hinged lid over half the top. A jar containing bait, such as squid, clams or fish waste, is hung between the entrance tunnels. The traps are fished at intervals of 1 to 10 days, depending on the season and the weather.

To keep abreast of developments in the industry and effects on the crab resource, California Marine Fisheries biologists are conducting extensive research into habits, numbers, and growth of the market crab. Samples of catches are taken aboard ship, measurements are taken, and laboratory tests made. Tests are in progress also of devices to permit the escape of legal-size crabs when storms carry away the traps, so as to prevent waste.

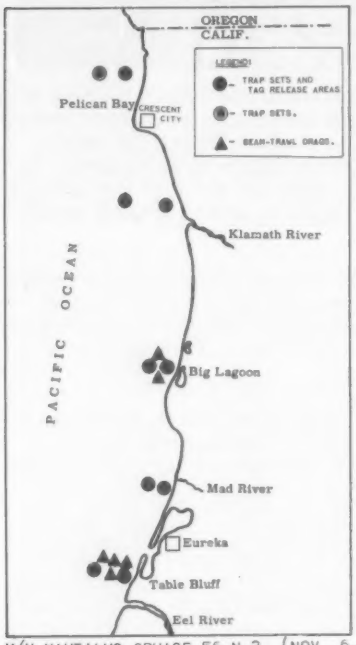
Through such methods the scientists hope to be able to predict well in advance the cycles of good and poor fishing success and to amass enough accurate evidence to make sound recommendations for protective regulations whenever needed. (Outdoor California, November 1956.)

* * * * *

DUNGENESS CRABS STUDIED OFF CENTRAL AND NORTHERN CALIFORNIA (M/V Nautilus Cruise 56-N-3): A study of dungeness or market crab (Cancer magister) off Central California in the San Francisco area and off Northern California in the Eureka and Crescent City areas (see chart) was continued from November 6-25, 1956, by biologists aboard California's Department of Fish and Game M/V Nautilus. The objectives of the cruise were to study the abundance and condtion of the

dungeness crab; the sizes of the preseason crabs; tag legal-size crabs; and sample juvenile crabs by beam trawling.

Forty crab traps were used in the San Francisco area. Ten traps were set in each of the four areas fished. These traps were set and pulled after fishing approximately four hours.



M/V NAUTILUS CRUISE 56-N-3, (NOV. 6-25, 1956)

Off Eureka and Crescent City traps were set in the Table Bluff, Mad River, Big Lagoon, Klamath River, and Pelican Bay areas. Depths fished ranged from 60 feet to 180 feet. For shallow and deep-water fishing in each area the traps were set in two separate strings. Seventeen traps were lost due to rough weather from November 12 to 14 off Table Bluff.

An eight-foot beam trawl with a 1-inch mesh net was used to catch juvenile crabs and to supplement trap catches for tagging legal crabs.

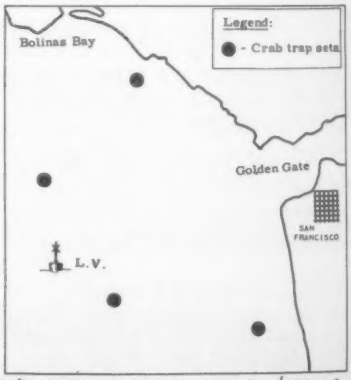
San Francisco: A total of 232 market crabs were caught in areas off San Francisco. Of these 170 (73.3 percent) were legal (7-inch males), 58 (25.0 percent) were sublegal males, and 4 (1.7 percent) were females. The number of legals averaged slightly over 4 per trap. The percentage of soft legals was 2.9 percent (5 out of 170 crabs).

Eureka-Crescent City: A total of 224 trap sets were made in the Northern California areas. These sets yielded 833 market crabs. Of these 693 (83.2 percent) were legal, 124 (15.0 percent) were sublegal males, 2 (0.2 percent) were females, and 14 (1.6 percent) were juvenile crabs. The percentage of legals per trap ranged from a low of 62.2 percent at Table Bluff to a high of 100 percent off Big Lagoon.

The soft condition of legal crabs ranged from none soft off the Klamath River to a high of 18.8 percent soft for Table Bluff Light Station.

Measurement of Crabs: Shoulder-width measurements were made on all adult crabs caught by the traps and beam trawl. A shoulder-width measurement is made just in front of the last antero-lateral spine. At least 50 juvenile crabs from each beam trawl sample were measured and the remainder counted. These data with previously collected information will be used in studies of the composition of the crab resource.

Tagging: A total of 230 crabs were tagged with Peterson disks attached by nickel pins run through the carapace. An electric drill was used in making the holes through the lateral portion of the shell.



M/V NAUTILUS CRUISE 56-N-3, (NOV. 6-25, 1956)

A total of 235 crabs were tagged with stainless carapace strap tags. These tags were type 316 stainless steel and of 0.008 x 0.5 x 2.0 inch dimension. These tags were applied by wire looped on the last antero-lateral spines. Type 302 stainless 0.025-inch diameter wire was used.

A total of 239 crabs were double-tagged, using both the disk and strap tags.

Tagged crabs were released in 9 locations from Eureka to Crescent City.

Beam Trawling: A total of 6 drags were made with the beam trawl. These drags were of 15- to 30-minute duration. Market crabs were taken in 5 out of the 6 drags and included several year-classes. As many as 720 juvenile crabs of an average shoulder width of 1 inch (25.2 mm.) were caught in one 30-minute tow off Table Bluff in 15-20 fathoms of water.

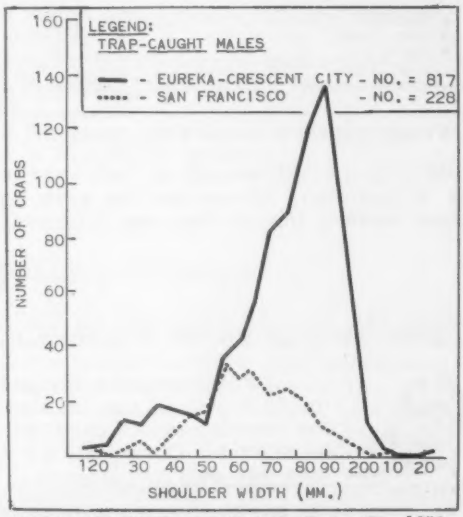
Location	Depth In Feet	Legal Crabs Caught	Tagged	Average Shoulder Width for Legals	Percentage of Legals
	Feet	(No.)		Millimeters	%
San Francisco	60 & 102	170	0	173.1	2.9
Table Bluff	180	44	41	185.3	18.8
Table Bluff	100	149	129	179.3	17.9
Mad River	168	93	89	183.6	12.9
Mad River	84	50	48	181.7	14.0
Big Lagoon	72 & 84	110	110	181.9	4.7
Big Lagoon	180	90	90	184.4	2.2
Klamath River	96	6	6	189.3	0
Klamath River	180	3	3	191.7	0
Pelican Bay	150	0	0	0	0
Pelican Bay	96	188	188	179.0	15.4

Juvenile crabs caught off Big Lagoon were of an average shoulder width of $1\frac{1}{4}$ inches (31.5 mm.). Approximately equal numbers of male and female juvenile crabs were taken by the beam trawl.

Legal Crab Summary: The above table summarizes the trap catch of legal-size male crabs taken during the cruise.

* * * * *

POPULATIONS OF SARDINES, JACK AND PACIFIC MACKEREL, AND ANCHOVIES SURVEYED BY M/V "N. B. SCOFIELD" (Cruise 56-5-8): To census the populations of sardines, northern anchovies, and Pacific and jack mackerel north of Pt. Conception and to collect rockfish were the objectives of this cruise (November 23-December 13, 1956). The California Department of Fish and Game research vessel N. B. Scofield operated off the coast of California from Bodega Bay to Point Dume, including Cordell Bank, the Farallone Islands, and the island groups just south of Pt. Conception (see chart).

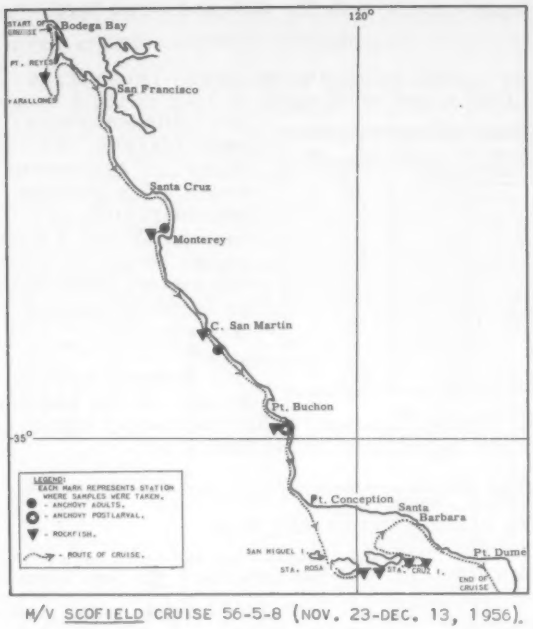


WIDTH FREQUENCIES--DUNGENESS CRAB, NOV. 1956 (M/V NAUTILUS CRUISE 56-N-3).

A total of 65 light stations were occupied between Bodega Bay and Pt. Conception. Adult northern anchovies were taken at one station and postlarval anchovies at three stations. No sardines, Pacific mackerel, or jack mackerel were observed at light stations or while scouting.

The N. B. Scofield traveled a total of 299 miles while scouting between stations: 3 schools of anchovies, 20 schools of sauries, and a few small groups of jack smelt were observed.

Seven species of rockfish were taken on hook and line during daylight fishing at four stations north of Pt. Conception and four stations at the Channel Islands. These will be used for later study of the characteristics of the genera Sebastodes.



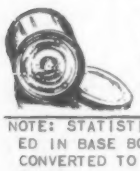
M/V SCOFIELD CRUISE 56-5-8 (NOV. 23-DEC. 13, 1956).

Two species of Coelenterate medusae were observed in very great numbers for approximately 50 miles along the coast south of Bolsa Pt. In addition, tunicates of the genus Pyrosoma and Salpa were observed in large numbers at various points along the route.

Sea surface temperatures ranged from 10.60° C. (51.08° F.) at Pt. Lobos to 13.90° C. (57.02° F.) at China Harbor near Morro Bay. Bathythermograph casts which were made to a depth of 450 feet revealed no definite thermocline. In the coastal areas surveyed, uniformly cold water prevailed with little or no decrease in temperature from the surface to the bottom. The depth at various stations ranged from 6 to 210 fathoms.

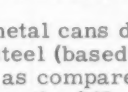
The scarcity of sardines and mackerel observed on this cruise closely parallels the conditions found in this northern area on the November 1955 survey cruise. In 1955 only a single sample of both sardines and jack mackerel were taken north of Pt. Conception. These few fish were taken in the harbor of Avila. The rest of the coast north to Bodega Bay was relatively barren during both years.

Cans--Shipments for Fishery Products, January-November 1956



Total shipments of metal cans during January-November amounted to 106,619 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 97,596 tons in the same period of 1955. During the month of November the packing of fishery products was confined largely to shrimp, sardines, and tuna.

NOTE: STATISTICS COVER ALL COMMERCIAL AND CAPTIVE PLANTS KNOWN TO BE PRODUCING METAL CANS. REPORTED IN BASE BOXES OF STEEL CONSUMED IN THE MANUFACTURE OF CANS, THE DATA FOR FISHERY PRODUCTS ARE CONVERTED TO TONS OF STEEL BY USING THE FACTOR: 23.0 BASE BOXES OF STEEL EQUAL ONE SHORT TON OF STEEL.



Canned Fish Production Higher in 1956

Increases in the packs of tuna, Alaska salmon, Maine sardines, and Pacific mackerel are largely responsible for the 10-percent increase in the 1956 production of fish canned for human food in the United States and its Territories. In 1956 the pack of fish and shellfish for human food amounted to 650 million pounds as compared with 588 million pounds in 1955.

The tuna pack of 227 million pounds in 1956 set a new record, beating the 1955 pack by 31 million pounds. The Alaska salmon pack was 144 million pounds, 30 million pounds higher than in 1955, but the Puget Sound salmon pack of 23 million pounds was 20 million pounds less than in the previous year.

A larger run of red salmon in western and central Alaska and a better-than-usual run of chum salmon in central and southeastern Alaska were responsible for the gains made in the 1956 Alaska salmon pack. The Puget Sound area experienced its usual "even-year absence" of pink salmon which, because of their two-year cycle, historically have large runs on odd-numbered years and almost no fish on even ones.

Pacific Coast firms engaged in canning Pacific and jack mackerel packed 50 million pounds in 1956, twice the 1955 pack. This heavy pack was due to a great extent to the extremely low sardine catch, and the canners turned to mackerel as an alternative. The Pacific sardine pack of 32 million pounds was just half what it was in 1955. The Maine sardine canners, which had a much better year in 1956, packed 45 million pounds, an increase of 19 million pounds over 1955.

The South Atlantic and Gulf oyster pack of 4.3 million pounds was down considerably below the 1955 pack of 5.3 million pounds. Shrimp canners, with a pack of 13.8 million pounds in 1956, were slightly ahead of the previous year.

Byproducts Production in 1956

The production of fish meal in the United States and Alaska set a new record--the 296,000 ton produced in 1956 exceeded the 264,000 tons produced in 1955, which in turn had broken all previous marks. Approximately 70 percent of the 1956 production of 208,000 tons of fish meal was from menhaden--a record for menhaden meal.

There were 26,500,000 gallons of fish oil produced, seven percent more than in 1955 but considerably less than the 1936 pack of 39,900,000 gallons.

Federal Purchases of Fishery Products

CANNED FISHERY PRODUCTS PURCHASED BY DEPARTMENT OF DEFENSE, 1956: Canned tuna, salmon, and sardine purchases in 1956 for the use of the United States Armed Forces by the Military Subsistence Market Centers were substantially higher than for any year since 1953. Although canned tuna purchases in 1956 were somewhat lower than in 1954, canned salmon and sardine purchases, on the other hand, were substantially higher.

Table 1 - Canned Fishery Products Purchased Through Military Subsistence Market Centers, 1953-56

Canned Product	1956	1955	1954	1953
	.... (1,000 Pounds)			
Tuna	3,334	2,206	3,779	1,298
Salmon	2,798	2,785	471	766
Sardines	236	143	450	1,899

A total of 1,107,000 pounds of canned tuna, 2,197,000 pounds of canned salmon, and 5,000 pounds of canned sardines were purchased October-December 1956 for the use of the United States Armed Forces by the Military Subsistence Market Centers. This was substantially more than was purchased during any other quarter in 1956.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1956, P. 37.

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FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPARTMENT OF DEFENSE: December 1956: The U. S. Military Subsistence Market Centers in December 1956 purchased 2,030,698 pounds (value $1,092,627) of fresh and frozen fishery products for the use of the Armed Forces. This was about 6.1 percent less in quantity and 2.3 percent less in value than the purchases in November 1956. When compared with December 1955, purchases in December 1956 were higher by 13.6 percent in quantity and 21.7 percent in value.

Prices paid for these fishery products by the Department of Defense in December 1956 averaged 53.8 cents a pound as compared with 51.7 cents a pound in November and 50.2 cents a pound in December 1955.

In addition to the purchases of fresh and frozen fishery products reported, the Armed Forces make some local purchases which are not included above. Therefore, actual purchases are higher than indicated, but it is not possible to obtain data on the local purchases by military installations throughout the country.

Year 1956: Purchases of fishery products for the 12 months of 1956 totaled 26,610,267 pounds, valued at $13,413,350--6.5 percent more in quantity and 22.7 percent more in value than the purchases made during the 12 months in 1955.

The over-all average price for fishery products purchased was 50.4 cents a pound in 1956, 43.7 cents in 1955, and 41.1 cents in 1954. The general increase in the average price is due principally to purchases of more expensive fish and shellfish items like shrimp, scallops, and oysters rather than a general price increase.

Purchases of Fresh and Frozen Fishery Products by Department of Defense (December and 12 Months 1956 With Comparisons)

QUANTITY					VALUE				
December		Total			December		Total		
1956	1955	1956	1955	1954	1956	1955	1956	1955	1954
(1,000 Lbs.)					($1,000)				
2,031	1,787	26,610	24,989	25,290	1,093	897	13,413	10,929	10,395

Fish-Cookery Demonstrations for First Half of 1957

A total of 91 fish-cookery demonstrations for the first half of 1957 have been arranged by the Bureau of Commercial Fisheries of the United States Fish and Wildlife Service. Additional projects are being scheduled.

The fish-cookery demonstrations are presented to the schools in connection with the school-lunch program, and to home extension agents, restaurant personnel, home economic classes, and cookery specialists for private firms.

This year's program to date includes 72 school-lunch demonstrations and 19 appearances at other groups. Since the program started in 1946, the Fish and Wildlife Service has given 1,544 demonstrations of which 1,234 were for school-lunch personnel.

School-lunch demonstrations thus far scheduled are as follows: Mississippi, 32; Georgia, 12; Texas, 9; Maine, 8; Virginia, 4; New York, 3; Maryland, 2; and one each for Tennessee and Massachusetts. Special demonstrations for institutional and extension personnel will be given in Colorado, Idaho, Indiana, Maryland, Michigan, Oregon, Washington, and Alaska.

Trained home economists explain the proper preparation of appetizing, economical, nutritious, and easy-to-prepare dishes. Fishery marketing specialists give necessary information on supplies and marketing conditions and often have arranged for fish distributors to expand their market to meet the potential developed by the demonstrations.

The fish featured in each of these projects are available in each area in good supply and are in the low-cost field. They include frozen fillets or portion fish such as cod, haddock, and ocean perch; canned fish such as tuna, flake fish, and mackerel; and precooked fish.

Special attention is given in the school-lunch programs to recipes which provide the two ounces of cooked protein to meet the Type A school-lunch requirements. The recipes used were developed at the Fish and Wildlife Service test kitchens at College Park, Md., and Seattle, Wash.

Fisheries Loan Fund

LOANS APPROVED: Thirty-five loans, totaling $1,196,330, have been approved under the fishery loan fund program up to February 4, 1957, the Secretary of the Interior announced on February 12.

More than 125 applications have been received, five of which were rejected. Other requests for loans for purposes not covered by the provisions of the law have been returned to the applicants.

Of the 35 applications approved, 18 were from the New England area, 7 from the Pacific Coast, 1 from the South Atlantic Coast, 1 from the Gulf of Mexico, 1 from the Great Lakes, and 7 from Alaska.

The largest loan to date is for $250,000 to the Delta Towing and Transportation Company, Incorporated, of Pascagoula, Miss., for repairs, modernization, and refinancing of menhaden vessels. The smallest is to William Estrada of Juneau, Alaska, who will receive $1,500 for vessel replacement.

Fishermen of Gloucester, Mass., had 15 loans approved for refinancing, gear replacement, operating expenses, and vessel repairs; and two firms in Boston had loans authorized. One Newport, R. I., fisherman will receive a loan.

The loans approved for Gloucester are as follows: Joseph Parisi, $23,785; Maristella, Inc., $49,500; Mrs. Rose P. Bertolino, $25,500; Twin Sisters, Inc., $19,550; Matthew Parisi, $35,000; Jerome Palazola, $10,000; North Atlantic Trawling Co., $49,875; Mrs. Ray Adams Pine, $22,084; Mrs. Margaret Sinagra, $6,632; Salvatore Frontiero, $39,323; Schooner Thomas J. Carroll, Inc., $60,000; Wild Duck, Inc. $59,000; Andrea G. Corporation, $20,131; Schooner Raymonde, Inc., $36,325 (refinancing only); and Clarence Leveille, $3,362.

In Boston, Trawler Four, Inc., will receive $65,000 for refinancing and vessel repairs; Trawler Cormorant, Inc., has been authorized to receive $60,000 for refinancing; and Leo E. Destremps, of Newport, R. I., will receive $7,540 for the same purposes.

In the South Atlantic there is one recipient, A. M. Acuff, Inc., of Eastville, Va., who will get $8,800 for vessel and gear replacement.

Loans approved for Pacific Coast applicants are: California:--Gestur R. Armann, Costa Mesa, $6,000 for repairs and refinancing; Dorothy and Russell Farnell, Westminister, $20,000 for repairs and refinancing; John E. Leanders, San Diego, $79,900 for refinancing; M. Machado Medina, San Diego, $155,000 for refinancing; Katherine Tierheimer, Torrance, $3,850 for vessel improvement; Joe E. Penacho, San Diego, $45,000 for refinancing; Washington:--Woodrow E. Anderson, Bellingham, $8,873 for refinancing.

In the Great Lakes area, a loan of $5,500 was approved for Richter Fisheries of South Haven, Mich., for vessel repairs, gear replacement, and refinancing.

Approval or rejection of the loans is the responsibility of the Department of the Interior. The disbursement of the funds and servicing of the loans is handled by the Small Business Administration under an agreement with the Department of the Interior.

Florida

FISHERIES RESEARCH, OCTOBER-DECEMBER 1956: The following are some excerpts from the Quarterly Report on Fisheries Research, December 1956, of the Marine Laboratory of the University of Miami.

Small Shrimp Studies: The analysis of the data collected during the mesh experiments on the M/V Manboy is continuing. The variation about the average escapement of each size of shrimp through the various mesh sizes has been computed as a means of showing the escapement of small shrimp through each net. The amount and type of trash present in these hauls is being compared with the total escapement and the escapement of the various sizes of shrimp. The size distributions of shrimp taken in both the cod end and the cover bag plotted throughout the year suggest that two groups of small shrimp may enter the fishery--one in October and November and one March through May--and that they can be traced for several months. These groups may result from two separate spawning peaks, and that they appear to increase in an orderly manner is suggestive of growth.

Black Spot Control in Shrimp: Further experiments concerning the use (and possible misuses) of sodium bisulfite to retard the development of black spot in shrimp, were carried out. Results from these tests indicate that the quality of the shrimp is not adversely affected, and in certain cases may be slightly improved. Bacterial counts of the treated and nontreated samples showed no significant differences up until about the 15th day of iced storage.

Frozen Foods

ILLINOIS AND INDIANA LEGISLATURES CONSIDER CONTROLS: Frozen food controls have been incorporated in bills introduced in the legislatures of Illinois and Indiana. Indiana's House Bill 166 provides for licensing frozen food processing plants and in some 49 sections provides rules to cover temperature control, personal hygiene, operational practices, penalties, etc.

It is interesting to note that the Association of Food and Drug Officials of the United States last year adopted a resolution requesting all state regulatory officials to withhold such legislation until a model code is established to serve the best interests of the industry, the regulatory officials, and the public.

Great Lakes Fishery Investigations

SURVEY OF SAGINAW BAY COMPLETED FOR 1956 SEASON (M/V Cisco Cruise 9): This cruise, the last of the season, was planned to learn something of the factors influencing the spawning run of the lake herring (Leucichthys artedi) in Saginaw Bay. Gangs of nylon gill nets were set at several locations in Saginaw Bay, and night trawling was done in one area. A gang of gill nets (300 feet each of

$2\frac{1}{4}$-, $2\frac{1}{2}$-, $2\frac{3}{4}$-, 3-, and 4-inch mesh) set overnight in 3-4 fathoms north of Charity Island took 56 herring, 1 sauger (Stizostedion canadense), and 1 gizzard shad (Dorosoma cepedianum) indicating a fair number of herring in the area. Three days later, considerable night trawling in the same area resulted in a catch of only one herring, and the depth-recorder tracings indicated few fish. A few small smelt (Osmerus mordax) and alewives (Pomolobus pseudoharengus) were taken. Very heavy seas the day before the trawling operation may have affected the abundance of the herring in this shallow-water area. An oblique net was set in $6\frac{1}{2}$ fathoms NW. of Charity Island, on the same date as the above gang, and took 2 herring, both near the bottom.

A bull net (300 feet long, 120 meshes deep, $2\frac{1}{2}$-inch mesh) set in 13 fathoms off East Tawas with the float line on the surface took only 9 herring while a similar net set nearby with the float line 20 feet beneath the surface caught 36 herring and 1 smelt. An oblique net in this area took 9 herring at the 20- to 40- foot level and 2 herring at the 40- to 60- foot level. Eight herring were caught in another oblique net set over 26 fathoms off East Tawas. They were scattered from surface to bottom. Also taken in this net were 3 smelt, one alewife, one sauger, and 12 Leucichthys kiyi. The latter were in spawning condition.

The same bottom gang of gill nets mentioned above was set in 3 to 4 fathoms off Sand Point, and a bull net was set on the bottom in the same area. Although none of the herring caught had spawned, they were very numerous at this station and some were ripe. The bull net took 1,632 herring (804 pounds), and 1,790 herring (958 pounds) were taken in the regular bottom gang of gill nets. The herring in any given mesh size were fairly constant in size, and the size of the fish increased with the mesh size. One very large herring weighing 2 pounds 9 ounces was taken in the 3-inch mesh.

A gang of gill nets consisting of 300 feet each of $2\frac{1}{2}$-, $2\frac{3}{4}$-, 3-, and 4-inch mesh was set northeast of Bay City in $3\frac{1}{2}$ fathoms. Only 31 herring were caught here. Other species included 33 perch (Perca flavescens), 31 white suckers (Catostomus commersoni), 2 smelt, 2 carp (Cyprinus carpio), 1 gizzard shad, 1 northern pike (Esox lucius), 2 saugers, and 1 walleye. The walleye was tagged and released.

A hydrographic transect was run from Bay City to East Tawas. Surface temperatures were recorded at all times the boat was under way. Water temperatures are generally about 2° C. cooler in the Bay than they are near the mouth of the Bay, where Lake Huron water predominates. Surface water temperatures ranged from 4.5° C. (40.1° F.) in the shallow water to 8.6° C. (47.5° F.) in the deeper areas, with no thermal stratification remaining in any area covered.

Gulf Exploratory Fishery Program

FISH SCHOOL SAMPLING AND SCALLOP EXPLORATIONS OFF ALABAMA AND FLORIDA (M/V Oregon Cruise 43): Sampling of fish schools and explorations for scallops along the Alabama and Florida coasts were the objectives of the Service's exploratory vessel Oregon during a 17-day cruise completed on February 21. A total of 31 fish-trawl and 54 scallop-dredge stations were made during the trip.

South of Mobile Bay 21 drags were made in 19 to 30 fathoms, using a 52-foot New England otter trawl, rigged with rollers and with a $\frac{3}{4}$-inch cod-end liner. Most of the schools were found to be rough scad (Decapturus), chub mackerel (Pneumatophorus), and sardine (Sardinella). Large amounts of noncommercial or scrap fish (2,000 to 5,000 pounds a drag) were caught, consisting mostly of long-spined porgies (Stenotomus caprinus) and croakers. Red snapper, varying in weight from under 1 to over 30 pounds each, were caught in most tows. The best snapper catch was 200 pounds of mixed sizes, from 19 fathoms.

From off Cedar Keys to Tampa Bay, 10 fish-trawl drags were made in depths of 7 to 16 fathoms. Croaker, spot, grunts, pinfish, grouper, and snapper were caught in mixed quantities of from 500 to 1,500 pounds per one-hour tow. Small numbers of rough scad and round herring (Etrumeus) were caught in several drags. There were no depth-recorder indications of school fish in this area.

From south of Mobile to Cape St. George, Fla., 54 scallop-dredge stations were made in 9 to 27 fathoms. Catches of live scallops were small, although dead shells were very abundant. The best drag yielded 225 2- to 2½-inch Pecten gibbus. Meat yield averaged about 140 "eyes" a quart.

Maine Sardines

ADVERTISING CAMPAIGN IN SOUTHERN STATES LAUNCHED: A spot radio campaign, utilizing more than 100 stations in ten southern states, will feature the Maine Sardine Council's promotional activities during the mid-winter Lenten period, a January 25 news release announces. The spots were scheduled to go on the air about February 4 and were to continue for 13 weeks at the rate of from 12 to 20 a week per station.

The area selected for coverage includes the states of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Texas, Louisiana, Mississippi, and Tennessee. The Council's over-all program would also include merchandising activity and special promotions in the South as well as other sections of the country.

The advertising theme will be based on "Sardines from Maine in the familiar flat can that you and your folks know so well." Both live and recorded commercials will tell the story.

"Maine sardines are in good supply and we expect our campaign to further stimulate demand in the southern states which is our best sales area," the Executive Secretary of the Maine Sardine Industry stated.

The Maine Sardine Council is a department of the State of Maine financed by a 25-cent a case tax imposed on the canners, at their request, for an industry development program. During the 1956 season the industry packed 2,221,000 cases of Maine sardines.

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INDUSTRY LAUNCHES NEW PRODUCT DEVELOPMENT PROGRAM: A program of new product development was announced by the Maine Sardine Council on January 30, 1957. The developmental program will be conducted at its recently-established and well-equipped Bangor Research and Quality Control Laboratory.

The Executive Secretary said that a full-time expert would be engaged to experiment on different flavors, oils, and sauces for the existing types of sardine pack, as well as to develop entirely new sardine products.

"Our industry is entering this important field of research as it realizes the necessity of keeping abreast of the rapidly changing conditions in the food business," he stated.

The Council believes that there are many wide-open avenues for such research and that improved sardines and sardine products would be the eventual result.

Marketing Prospects for Edible Fishery Products, January-March 1957

United States civilian consumption of fishery products in the next few months is expected to average a little higher than a year earlier. Stocks of both canned and frozen products on January 1 were somewhat larger than on the same date last year. Imports through about mid-spring probably will not differ substantially from those in the closing part of 1956. Retail prices of fishery products during the next few months will likely be close to the record levels of a year earlier, reflecting continued strong demand.

Per capita consumption of fishery products in 1956 was up a little from the 1955 rate. Smaller increases occurred for both canned and frozen commodities, but the rate for the fresh items was about unchanged. Retail prices for fishery products as a group, judging from the wholesale prices, were the highest in recent years.

Commercial landings of edible fish and shellfish were about 4 percent higher in 1956 than a year earlier. Increases were the largest for the species used mainly for canning, and this was reflected in heavier packs of canned salmon, Maine sardines, tuna, and mackerel. The 1956 catch and the canned pack of California sardines was substantially lower than in 1955. The pack of canned tuna last year was a record one. A much greater proportion of the pack in 1956 was from tuna landed by American fisheries. In recent years a sizable part of the canned pack has been from frozen tuna imported from Japan, but the 1956 catch of tuna by Japanese vessels was smaller than in 1955.

The volume of fish and shellfish frozen commercially in the continental United States in 1956 was down from the preceding year. Stocks of frozen products at the end of the year totaled somewhat larger than a year earlier. The increase in stocks reflects mainly the much heavier imports of frozen fish fillets and shrimp in 1956.

Imports of fresh and processed fishery products in 1956 were noticeably higher than in 1955, but exports were a little lower. Canned salmon exports were reduced heavily.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Fish and Wildlife Service, and published in the former agency's February 22 release of The National Food Situation (NFS-79).

NOTE: SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1956, P. 40.

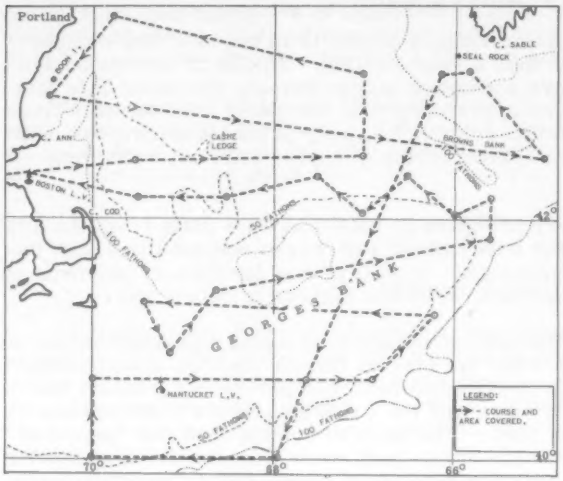
North Atlantic Fisheries Exploration and Gear Research

ABUNDANCE AND DISTRIBUTION OF HERRING LARVAE MEASURED (M/V Delaware Cruise 57-1) In order to measure the abundance and distribution of herring larvae and to record water temperatures over the Gulf of Maine and the Georges Bank area, over 2,000 miles were covered by the Service's exploratory fishing vessel Delaware on a 10-day cruise which ended February 5. A total of 51 one-meter plankton net tows and 172 bathythermograph casts were made.

The offshore plankton survey was conducted in cooperation with the Service's Atlantic Herring Investigation, Boothbay Harbor, Maine.

Continuous plankton tows were made at the surface and at 10 meters with the automatic Hardy Plankton Sampler. Six hundred and thirty-six drift bottles were

released at 53 stations in the offshore area to obtain information on the circulation pattern during this period of the year.



M/V DELAWARE CRUISE 1-57 (JANUARY 25-FEBRUARY 5, 1957).

The Delaware was scheduled to depart from East Boston on February 12, to conduct midwater trawl experiments and obtain material for technological studies.

A large Canadian-type 35-foot nylon herring midwater trawl was to be used in waters off the New England coast if sufficient concentrations of fish could be located with the electronic fish-indicating equipment installed aboard the Delaware. The first major objective was to locate concentrations of fish in midwater, for experience indicates that unless fish in concentrations are located in midwater with electronic equipment, chances for successful midwater tows are remote.

Two new instruments were to be used during the cruise; one, a newly-developed cable meter for $\frac{3}{4}$- to 1-inch wire and, the second, an air-pressure depth indicator recently-developed by the Service's exploratory fishing and gear research station at Boothbay Harbor, Me.

North Atlantic Fisheries Investigations

UNDERWATER TELEVISION EQUIPMENT TESTED (M/V Albatross III Cruise 85): Underwater television equipment was tested in 40-60 feet of water in the vicinity of Woods Hole, Mass., during the daylight hours of December 19 and 20 by the Service's fisheries research vessel Albatross III. Comparative tests were made of the Scottish Marine Biological Association's CPS Emitron and the United States Fish and Wildlife Service's Image Orthicon. The two underwater television bottom-viewing cameras were lashed together within the SMBA lighting gantry and lowered to or near the bottom.

Tests were made to examine both the picture quality and relative performance of the auxiliary equipment by both natural and artificial light. Bottom organisms and bottom types were clearly seen, but turbidity limited viewing to within five feet of the bottom.

North Pacific Exploratory Fishery Program

EXPERIMENTAL MIDWATER TRAWLING OFF WASHINGTON-BRITISH COLUMBIA: Experimental midwater trawling will be the objective of a 7-week cruise by the Service's exploratory fishing vessel John N. Cobb, which was scheduled to

leave Seattle on February 25. The experimental fishing will be conducted off the coasts of Washington and British Columbia.

This is the first in a series of midwater trawling cruises scheduled during 1957 to determine the practicability of a commercial midwater fishery for such food fishes as Pacific ocean perch, cod, ling cod, and other species which are known to spend at least part of their time off the bottom. If a successful midwater trawling method can be developed, it will open up vast new areas for commercial fishing, especially over rough and rocky bottom where the bottom trawlers cannot now operate.

First trials will be conducted using a 50-foot square-opening nylon midwater trawl designed and tested at the Service's gear research station at Coral Gables, Fla. An acoustic depth telemeter was to be employed to accurately determine and control the depth of the net at all times. A recording "Sea Scanar" was to be the principal instrument used for locating midwater schools of fish.

A previous test of this equipment during a cruise last year produced promising results. Catches of rockfish and hake were taken in midwater in quantities up to 5,000 pounds per 20-minute tow. Improvements in the fishing gear and electronic equipment have been made, which should increase their effectiveness. Considerable time will be spent during this cruise in studying the movements of fish in midwater and in learning to recognize different species on the echo-recording equipment, as well as in testing and improving the fishing gear itself.

Oregon

DUNGENESS CRAB STUDY IN YAQUINA BAY: In a project beginning in January 1957, biologists of the Oregon Fish Commission will attempt to determine the movement of dungeness crabs in Yaquina Bay, Ore.

The primary interest of the biologists is discovery of a suitable pattern for release of tagged crabs that can be applied to provide more extensive information in future larger-scale crab studies. To accomplish this objective, crabs tagged through the right corner of the upper shell with plastic Peterson discs were released at ten different locations in Yaquina Bay.

During the January-May 1957 period the investigators will be setting experimental crab pots at various points in the bay to trace the movements of the tagged crustaceans released in January. Should a large number of crabs move out of the bay and into the ocean, their departure is likely to be detected by a sudden scarcity of tagged individuals in the experimental crab pots.

The biologists claim that it may be possible to estimate the total number of crabs in Yaquina Bay with the type of information the experiment is expected to furnish. In addition, the study may also give some indication of what happens to crabs after increased flows of fresh water into bays during freshets. On several occasions in the past, crabs have been scarce in Yaquina Bay following freshets. It may be that during influxes of fresh water crabs burrow into mud on the bay bottom where salinities are more to their liking.

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PLANS FOR NEW SALMON HATCHERY COMPLETED: Final plans have been completed for construction of the Cascade Salmon Hatchery on Eagle Creek, Columbia River Tributary just above Bonneville Dam, the Oregon Fish Commission announced February 16.

The supervising engineer in charge of Columbia River development projects for the Oregon Fish Commission said the new fish plant will have facilities for raising 11¼ million salmon annually. Fall chinook salmon will be the primary species propagated, but production of approximately one million chum and silver salmon each year is anticipated.

Cascade Hatchery will be the second new salmon propagating station constructed by the Commission under the federally-financed Columbia River Development program. Four other Fish Commission hatcheries have been completely renovated and enlarged under the program.

"One of the main considerations in selection of the Cascade site is the ample supply of satisfactory water in Eagle Creek," the engineer stated. The supply is not likely to change drastically in the foreseeable future because the Eagle Creek watershed lies entirely within Mt. Hood National Forest. More than 3,000 feet of 36-inch pipe will be used to supply water for operation of the hatchery.

A special use permit to operate the hatchery has been granted to the Fish Commission by the U. S. Forest Service, since the Cascade site is located on the Eagle Creek forest camp and picnic area.

Among the primary features of the new station will be 30 concrete rearing ponds, an adult holding pond which mature fish will reach via a fishway connecting to Eagle Creek, and two modern residences for hatchery personnel.

Salmon eggs will be hatched in a large hatching house with 7,200 square feet of floor space. Included in the hatching house will be a 100-ton capacity cold-storage room for holding fish food, a food preparation room, and an office for the hatchery superintendent. Another large building will house a workshop, vehicles, and other equipment.

Native runs of fall Chinook salmon now existing in Eagle Creek will be the main source of eggs for operating the Cascade Hatchery. Chum and silver salmon are not known to spawn in Eagle Creek at the present time, but stocks will be introduced from other streams in an attempt to establish regular sources of eggs from these two species for the hatchery.

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SALMON CONSERVATION PROGRAM TO CONTINUE: A program of salmon conservation will be continued in Oregon coastal streams by the Fish Commission of Oregon provided there is no cut in appropriations for coastal salmon work by the legislature.

This view was expressed by the Commission at its monthly meeting in Portland in November 1956. The Commission Chairman said recent voter approval of a measure closing streams south of the Columbia River to commercial fishing for salmon has resulted in several inquiries as to whether or not the Commission intends to disband its present coastal salmon management work. The program includes fish propagation at five hatcheries, construction of fishways, removal of log jams and other barriers to migration, and biological studies to determine the factors affecting salmon production in the streams.

"By law, the Fish Commission is charged with maintaining the food fishery resources of Oregon," the Chairman stated. "Prohibition of commercial fishing in the coastal streams does not alter the Commission's delegated responsibility for safeguarding and conserving salmon and other food fish resources in these areas."

Salmon runs in Oregon coastal streams must still be considered food fish resources, the Commission pointed out, because the offshore troll salmon fishery depends upon fish produced in the streams. The Commission further stated that a biologically-sound program of fisheries management is still necessary to maintain stocks of salmon in the coastal streams, a November 27, 1956, news release from the Commission announces.

Pacific Oceanic Fishery Investigations

ALBACORE TUNA DISTRIBUTION BOUNDARIES FOUND IN PACIFIC: Although albacore tuna--the source of choice white-meat tuna--probably does not realize it, it is actually fenced in by an "isotherm," a "thermocline," and a food boundary. So report the two Fish and Wildlife Service research vessels--the John R. Manning and the Charles H. Gilbert--which have completed fall surveys in the broad Pacific, verifying data which had previously been assembled.

It seems that water colder than 57° F. has no appeal to the albacore. In hundreds of miles of experimental fishing, temperature-taking and water sampling, the crews of these vessels could find no albacore on the cold side of the "isotherm"--the meandering unstable line along which the temperature is 57° F.

Likewise, the researchers verified information that the albacore stays above the "thermocline," an imaginary sheet which separates the warm waters of the surface from the very cold waters below. The thermocline is sometimes only a few feet down and sometimes 200 feet or more below the surface.

The third limit to the distribution of albacore--the "food boundary"--is the barren water where few of the microscopic animals which are the basis for fish food exist. This boundary can sometimes be recognized by the color of the water and sometimes only by scrutinizing samples of the water with a microscope.

All of this may seem relatively unimportant to the landsman, but to the men in the boats--the men who help feed America by bringing in the fish--such findings are important. Showing these fishermen where not to look can make the difference between well-utilized hours and a lot of wasted time--for much of the albacore fisherman's time is spent in seeking fish.

Nor is the albacore the only fish limited by such things as isotherms, thermoclines, and food supplies. Each species of fish, like every other animal, has its habitat--conditions under which it can live and conditions under which it can't. There are some 200 kinds of fishes in the ocean which are currently being used for food. As the ocean is a restless mass, these various boundaries with their high sounding names continually change.

Correctly reading the pattern of the distribution of fishes in the wide waters of the ocean leads to more efficient and economical fishing operations, hence the value of research.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, FEBRUARY 1957, PP. 25-27.

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LIVE-BAIT TILAPIA CULTURE EXPERIMENTS: In an effort to find ways of supplementing the live-bait supply in Hawaiian waters, POFI is investigating the feasibility of culturing tilapia in tanks. During six weeks (December 1956-1957) 32 females in one of the tanks produced approximately 4,500 young. In a second tank, located in the shade and with water temperatures 1°-2° F. lower, no young were produced during the same period.

In studying tne suitability of these fish for chum to be used during live-bait fishing, it was discovered that bait-size tilapia (less than 3 inches) may be transferred directly from salt to fresh water without any mortality. On the other hand, they must be gradually acclimatized, during a 12-hour period, when transferred from fresh to sea water.

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TAGGED YELLOWFIN TUNA HINTS VERTICAL MIGRATION PATTERN: In at least one instance a yellowfin tuna--normally found near the surface--has taken to deep-water swimming in the open sea, United States Fish and Wildlife Service fishery research has disclosed.

Late in 1955, a Fish and Wildlife Service research vessel tagged and released a troll-caught yellowfin tuna near Christmas Island in the mid-Pacific. Thirteen months later the same fish was recaptured by a Japanese fishing boat some 700 miles to the east and deep down in the ocean. This is the first time a "surface-schooling" yellowfin has been known to have been taken as a deep-swimming fish in the open sea. The fish had grown considerably in the 13-month interval--from 55 pounds to 95 pounds.

The finding of this one yellowfin as a deep swimmer is not a conclusive item, fishery biologists say, but it does indicate a "vertical pattern of migration" not hitherto demonstrated.

Data relative to horizontal migration habits of the various tuna varieties is being slowly accumulated. Last year, an albacore was taken--15 months after tagging--2,670 miles away. It had gained 40 pounds in weight. Another one traveled more than 2,000 miles. Big-eyed tuna have been known to migrate as much as 800 miles. Still another variety, the skipjack, has a much less pretentious travel record--one was caught only 30 miles away after 252 days; another went 40 miles in six days; others just "hung around" and were taken weeks later near the point of tagging.

Man's knowledge of sea dwellers is far short of his knowledge of land animals. For many reasons the migration patterns of fish are important not only to the biologist but to the fishing industry. But getting the migration pattern has been, and still is, a monumental task. In the first place it took a long time to develop tagging techniques which were not fatal to a high percentage of the fish tagged. It also took time to develop the type of tags which would withstand the rigors of many months in the ocean water. Then, too, the ocean is wide and fish are numbered by the millions, and the odds of recapturing a tagged fish are not too high.

Tags and tagging techniques are improving and as more fish are tagged the odds of retaking some of them are better. Thus, little by little, fishery biologists are learning more about the ocean and the fish that dwell in it--and the recapturing of the surface-schooling yellowfin as a deep-swimming fish is another bit to be added to the information about the species, information which will be of value to those who seek these fish for the American table.

Reclamation Fish Screen to Save Young Fish on Delta-Mendota Canal, California, Tested

The Tracy Fish Screen, built by the U. S. Bureau of Reclamation, was tested in February 1957 when the Bureau turned on all six pumps of the mammoth Tracy Pumping Plant on the Delta-Mendota Canal in Central California for the first time.

While the test was designed as a "shakedown" for the huge pumps, and not as a test for the screen, it did afford fish biologists an opportunity to observe the effectiveness of the screen.

The biologists estimated "several hundred thousand" small striped bass, shad, and smelt were screened away from the big pumps and into four collection tanks. This rough figure was considered significant because the test was made at a time when it was estimated there were very few fish in the stream and the downstream migration of small salmon had not started.

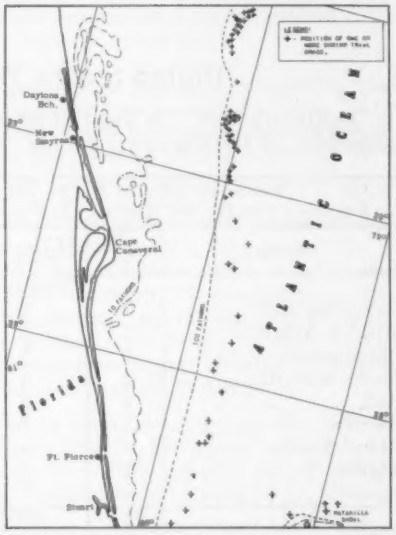
The rescued fish were trucked beyond the pump area and replanted in waters of the Sacramento-San Joaquin delta, points out the California Department of Fish and Game in a February 22 news release.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1956, P. 49.

South Atlantic Exploratory Fishery Program

FLORIDA EAST COAST DEEP-WATER SHRIMP SURVEY (M/V Combat Cruise 7): Deep-water shrimp trawling activities along the Florida east coast between St. Augustine and Stuart, and along the northern side of Little Bahama Bank were continued by the U. S. Fish and Wildlife Service-chartered shrimp trawler Combat from January 8 to February 6, 1957. In depths of 160-250 fathoms, 56 drags were made using 40-foot and 56-foot flat trawls.

From January 8 to 16, the Combat fished the area from off St. Augustine to New Smyrna Beach. Successful 3-hour drags north of N. latitude 29°40' caught royal-red shrimp (Hymenopenaeus robustus) at rates of 178 pounds, heads-on weight (75 percent 21-30 count; 25 percent 50 or more count, headed). South of 29°30' N. latitude, drags averaged 330 pounds of heads-on shrimp (57 percent 21-30 count; 43 percent 40 or more count, headed). The best single catch yielded a total of 650 pounds of heads-on shrimp.



M/V COMBAT CRUISE 7 (JAN. 8-FEB. 6, 1957).

From January 28 to February 6, trawling was carried out from off New Smyrna Beach to Stuart. At this time, catches in the New Smyrna area averaged 249 pounds of heads-on shrimp a drag (60 percent 21-30 count; 40 percent or more count, headed). South of 29° N. latitude, catches averaged about 30 pounds of shrimp (81 percent 21-30 count; 19 percent 35 or more count, headed). The highest catch south of Cape Canaveral contained 105 pounds of royal-red shrimp.

Highest concentrations during this period centered in the Daytona Beach to New Smyrna area. Six 3-hour drags on February 4-5 caught 1,470 pounds of heads-on royal-red shrimp.

Five drags were made in depths of 180-230 fathoms off the northwestern edge of Little Bahama Bank (Matanilla Shoal). No royal-red shrimp were caught in any of these drags.

* * * * *

SHRIMP-TRAWLING GEAR STUDIES: Systematic studies of shrimp-trawling gear will be a major activity at the Service's Gear Research and Development station located at Miami, Fla., during 1957.

The Service's gear research vessel the George M. Bowers will be used to conduct experimental fishing operations in Florida and Gulf of Mexico waters, with underwater television and divers with camera gear to observe and record the operational characteristics of representative types of commercial shrimp-trawling gear in use in the Southeastern shrimp industry. Studies will be made of the behavior of the nets, trawl doors, towing cables, floats, and other accessory gear under various towing speeds and fishing conditions. Attempts will be made to record the reaction of shrimp and fish to capture by the trawls.

Reports on the progress of the work will be issued periodically. A moving picture film of shrimp trawling gear in operation will also be produced.

United States Fishing Fleet[1/] Additions

JANUARY 1957: A total of 26 vessels, of 5 net tons and over, received first documents as fishing craft during January 1957--9 more than in January 1956. The Chesapeake and South Atlantic areas led with 8 vessels each, followed by Alaska with 4, the Middle Atlantic and Pacific areas 2 each, and the Gulf and New England area 1 each.

Table 1 - Vessels Issued First Documents as Fishing Craft, By Areas, January 1957

Area	January		Total
	1957	1956	1956
	(Number)		
New England	1	1	15
Middle Atlantic	2	2	26
Chesapeake	8	5	138
South Atlantic	8	4	119
Gulf	1	3	100
Pacific	2	1	76
Great Lakes	-	-	6
Alaska	4	1	40
Hawaii	-	-	1
Total	26	17	521

NOTE: VESSELS ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORT.

Table 2 - Vessels Issued First Documents As Fishing Craft, By Tonnage, January 1957

Net Tons	Number
5 to 9	13
10 to 19	4
20 to 29	1
30 to 39	7
40 to 49	1

1/ INCLUDES BOTH COMMERCIAL AND SPORT FISHING CRAFT.

United States and Alaska Fisheries Landings, 1956

TREND IN FOOD FISH LANDINGS IS DOWNWARD: Although the commercial food fish and shellfish landings in 1956 were 100 million pounds more than in 1955, they were still about 12 percent below the 1947-1950 average. Food fish taken

in 1956 totaled 2.8 billion pounds. This is 400 million pounds below the 1947-50 average.

Had the 1947-1950 rate of food fish landings been maintained in 1956, the landings would have totaled close to 3.6 billion pounds or 30 percent more than the actual landings, the U. S. Fish and Wildlife Service estimated.

United States and Alaska commercial landings of both food and industrial fish and shellfish in 1956 amounted 5.2 billion pounds--an all-time record. The previous record was 4.9 billion pounds in 1951. The 1955 landings totaled 4.8 billion pounds. In 1956, the landings consisted of 2.8 billion pounds of food fish and shellfish and 2.4 billion pounds of industrial fish.

The big catch of menhaden (an industrial fish used for manufacturing fish meal, oil, and solubles) in the Atlantic ocean and in the Gulf of Mexico was a principal factor in the 1956 record harvest. The menhaden landings totaled more than 2.0 billion pounds. This was the first time landings of two billion pounds were reported for any one variety in the United States. The menhaden landings in 1956 were up 200 million pounds over those for 1955 and marked the sixth consecutive year that the menhaden landings have broken the record set the previous year.

Analysis of the annual landings over the past several years indicates a sharp increase in the amount of industrial fish being taken by United States fishermen--one billion pounds in ten years--but a decline in the amount of fish harvested for human food--a 400-million-pound drop from the 1947-50 average.

Segments of the fishing industry, particularly the New England groundfish and the Pacific Coast tuna producers, point out that the food fish landings are far below the production capabilities of the United States and Alaska fishing fleets. Tie-up of fishing craft in some areas for as high as 90 days because of lack of markets is cited as evidence of this. The tuna fleet, which once numbered 214 large clippers, now numbers only 153 because of these long periods of inactivity.

Other species taken in considerably greater quantity in 1956 than in the previous year were tuna, 330 million pounds (271 million pounds in 1955); Pacific and jack mackerel 124 million pounds (59 million pounds in 1955); Alaska herring 103 million pounds (64 million pounds in 1955); and Maine herring 133 million pounds (99 million pounds in 1955). The landings of salmon amounted to 331 million pounds, up 21 million pounds from the low 1955 landings. Haddock landings likewise increased, amounting to 150 million pounds as compared with 135 pounds in 1955.

Landings of a number of important species were down sharply in 1956; Pacific sardines amounted to only 66 million pounds compared with 146 million pounds the previous year; shrimp (heads on) amounted to only about 220 million pounds compared with 236 million pounds the previous year; ocean perch totaled 151 million pounds, down 5 million pounds compared with 1955.

CONSUMPTION: Despite the decline in the catch of food fish during recent years, the per capita consumption of fish has remained fairly constant at 10-11 pounds edible weight, but has not increased principally because since 1950 the United States population increased by about 20 million. Large increases in imports which have displaced domestically-caught fish made this possible.

IMPORTS: During the years 1947-1950, imports of edible fish and shellfish averaged 860 million pounds (round-weight basis). In 1956 these imports totaled about 1.5 billion pounds. Imports supplied about 35 percent of the domestic supply of edible fishery products in 1956, compared with an average of 21 percent during the years from 1947 to 1950.

Imports received in considerably greater volume in 1956 were frozen groundfish fillets, canned salmon, and fresh and frozen shrimp. Receipts of fresh and frozen tuna were below the record 145 million pounds received in 1955.

TOTAL UTILIZATION: Total utilization of fish for all purposes--human food and industrial--in 1956 was 7.6 billion pounds round weight, of which more than a third, or 2.4 billion pounds (round weight), were imports.

EX-VESSEL VALUE: The 1956 record commercial fish and shellfish landings for both food and industrial use were worth $363 million ex-dock or ex-vessel. This compares with $338 million in 1955.

LANDINGS FOR LEADING PORTS: San Pedro, Calif., which has been the leading food and industrial fish landing port in the United States for many years, again captured that honor in 1956. Landings in San Pedro in 1956 (largely tuna, mackerel, and sardines) totaled 383 million pounds. The value of the catch ex-dock or ex-vessel was $29 million.

Gloucester, Mass., led other food fish ports with receipts of 250 million pounds, worth $7,600,000 ex-vessel. Gloucester landings were mainly ocean perch and whiting.

Boston, Mass., the Nation's principal port for the food fish such as haddock, cod, and pollock reported landings of 147 million pounds, worth $10 million to the fishing vessels.

San Diego, Calif., largely a tuna port, trailed Boston in poundage landed but surpassed the eastern city in the ex-vessel value of the landings. Landings at San Diego amounted to 135 million pounds, with a value of almost $19 million ex-vessel. New Bedford, Mass., famous for the scallop and flounder landed there, has 88 million pounds of fish and shellfish, valued at $12 million ex-vessel. Portland, Me., largely an ocean perch port, followed with landings of 58 million pounds, valued at almost $2 million ex-vessel.

NOTES: 1. STATISTICS ON UNITED STATES FISH AND SHELLFISH LANDINGS AND IMPORTS AS GIVEN IN THIS ARTICLE ARE BASED ON ROUND WEIGHT OR WEIGHT AS CAUGHT FOR FISH AND CRUSTACEANS AND WEIGHT OF THE MEATS FOR MOLLUSKS. IMPORT DATA WERE CONVERTED TO ROUND WEIGHT FOR FISH AND CRUSTACEANS AND WEIGHT OF THE MEATS FOR MOLLUSKS.

2. SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1956, P. 51.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, NOVEMBER 1956: Imports of edible fresh, frozen, and processed fish and shellfish in November decreased 37 percent in quantity and 36 percent in value as compared with October 1956. Compared with November

Table 1 - United States Foreign Trade in Edible Fishery Products, November 1956 With Comparisons

Item	Quantity			Value		
	Nov.		Year	Nov.		Year
	1956	1955	1955	1956	1955	1955
	(Millions of Lbs.)			(Millions of $)		
Imports:						
Fish and shellfish: Fresh, frozen & processed 1/	57.3	73.2	769.5	16.5	21.2	206.4
Exports:						
Fish and shellfish: Processed 1/ only (excluding fresh & frozen)	9.1	14.3	88.3	2.3	3.3	21.6

1/ INCLUDES PASTES, SAUCES, CLAM CHOWDER AND JUICE, AND OTHER SPECIALTIES.

1955 the imports for November 1956 were lower by 22 percent in both quantity and value. November 1956 imports averaged 28.8 cents a pound as compared with 29.0

cents a pound for the same month in 1955. Groundfish fillet (including ocean perch) imports in November 1956 were down sharply from the record high level of October 1956 and were also lower by about 50 percent from November 1955.

Exports of processed fish and shellfish in November 1956 declined about 23 percent in quantity as compared with the previous month, and were 37 percent below November 1955. The November 1956 value of these exports was 21 percent lower than the previous month, and down about 30 percent from the same month a year earlier. Exports of California sardines in November 1955 were close to double the total for November 1956.

* * * * *

GROUNDFISH FILLET IMPORTS HIGHER IN JANUARY 1957: Imports of groundfish (including ocean perch) fillets and fish blocks during January 1957 amounted to 19.0 million pounds, an increase of 23 percent over the 15.4 million pounds reported for the same month in 1956.

The increase was primarily due to more imports from Canada (up 2.6 million pounds) and Iceland (up 887 thousand pounds). Imports from Norway, Denmark, the United Kingdom, and France also were somewhat larger while receipts from the Netherlands and West Germany were less than in January 1956. Canada and Iceland accounted for 92 percent of the total January imports.

NOTE: SEE CHART 7 IN THIS ISSUE. ALSO, SEE P. 57 OF THIS ISSUE.

Virginia

NEW FISHERIES RESEARCH VESSEL: With the launching of the Pathfinder, the research vessel which is to be used to investigate problems relating to Virginia's

THE PATHFINDER, A NEW VIRGINIA STATE FISHERIES RESEARCH VESSEL, WAS LAUNCHED IN MARCH AT A SHIPYARD IN WEST NORFOLK, VA.

multimillion dollar sea-food industry, State scientists at the Gloucester Point Laboratory look to a new day in fisheries research. This is the first boat specifically designed for marine research in the Chesapeake Bay estuarine and coastal waters.

"The Pathfinder will be a floating marine laboratory to further our knowledge of the sea and its myriad forms of life," the Director of the Virginia Fisheries Laboratory declared.

The pioneering nature of the research program at the Laboratory is suggested by the name of the new vessel. The Pathfinder will enable scientists to continue their work under conditions which could not be weathered by the present vessel, the Virginia Lee. The new vessel will be equipped with winches for hauling dredges and trawl nets. A depth recorder will make tracings of the contours of the floor of the ocean and Bay. A quick-freeze box will preserve specimens until they can be carefully examined by scientists. Live tanks, properly aerated, will hold fish and other marine forms for delivery to the Gloucester Point Laboratory. A chemical laboratory for analysis of seawater is an integral part of the new vessel.

The keel for the Pathfinder was laid at a shipyard at West Norfolk in April 1956. She is 55 feet long, 16.5 feet in beam, and will be driven with a 120 horsepower Diesel engine. The steering devices are so arranged that the boat may be handled either from the pilothouse or from the flying bridge on top of the deckhouse. Installation of the engine, rigging, and other machinery will be completed after the new vessel is afloat.

Wholesale Prices, January 1957

United States fishing fleets resumed normal activities after the usual lay-ups during the year-end holidays, but many inland and coastal areas were hit by gales, snow, and ice. The January 1957 wholesale price index (121.8 of the 1947-49 average) for all edible fish and shellfish (fresh, frozen, and canned) was higher by 4.8 percent when compared with the previous month, but was slightly below (0.4 percent) the January 1956 index.

The drawn, dressed, and whole finfish subgroup index for January increased 13.1 percent as compared with December due to the usual price increases that follow periods of bad weather and a pick-up in demand when the New Year starts. January 1957 prices for the items in this subgroup did not go up as much as a year earlier and consequently were 6.6 percent lower as compared to January 1956. Prices for large drawn haddock, Lake superior whitefish, and domestic lake trout were lower by 11-31 percent, but halibut, salmon, and yellow pike were up 6-21 percent as compared with the same month in 1956.

The price changes in the fresh processed fish and shellfish subgroup from December to January were slight (up 4.2 percent). Fresh haddock fillets were up rather sharply at Boston and fresh shucked oysters were slightly higher at Norfolk. Compared with January 1956, this subgroup index for January 1957 was higher by 4.9 percent with the lower haddock fillet price more than offset by higher fresh shrimp and oyster prices. Fresh shrimp prices at New York during the month were higher by 8.7 percent as compared with January 1956.

The January 1957 subgroup index for frozen processed fish and shellfish was up 3.8 percent from December and 4.3 percent from the same month in 1956 Frozen haddock fillets were higher by 7 percent this January as compared with

December and about 2 percent higher than in January 1956. Frozen ocean perch fillet prices also increased this January by 3.6 percent over December, but were unchanged from January a year ago. Frozen shrimp prices at Chicago continued to be firm with a 3.2-percent increase over December and were 7.3 percent above the same month in 1956.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, January 1957

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices1/ ($)		Indexes (1947-49=100)			
			Jan. 1957	Dec. 1956	Jan. 1957	Dec. 1956	Nov. 1956	Jan. 1956
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.8	116.1	118.4	122.
Fresh & Frozen Fishery Products:					136.2	126.6	130.9	136.5
Drawn, Dressed, or Whole Finfish:					134.1	118.6	128.0	143.5
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.09	143.6	92.7	122.1	208.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.35	108.3	108.3	112.9	89.2
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.64	.64	143.8	143.8	144.9	135.4
Whitefish,L. Superior, drawn, fresh	Chicago	lb.	.59	.61	146.3	151.2	146.3	171.0
Whitefish,L. Erie pound or gill net, rnd., fresh	New York	lb.	.70	.71	141.5	143.6	149.6	141.5
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.57	.71	116.8	145.4	143.4	131.1
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.80	.36	140.7	84.4	80.3	117.3
Processed, Fresh (Fish & Shellfish):					140.3	134.7	135.5	133.7
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.46	.30	158.2	103.8	117.4	217.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.82	.82	128.8	129.6	128.8	118.5
Oysters, shucked, standards	Norfolk	gal.	6.12	6.00	151.6	148.5	148.5	136.1
Processed, Frozen (Fish & Shellfish):					122.7	118.2	118.6	117.6
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	103.4	103.4	103.4	104.7
Haddock, sml.,skins on, 1-lb. pkg.	Boston	lb.	.30	.28	94.2	87.9	87.9	92.6
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.28	114.8	110.8	108.8	114.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.84	.82	130.0	126.0	127.3	121.1
Canned Fishery Products:					101.5	101.2	100.6	102.2
Salmon, pink, No.1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.65	22.65	120.0	120.0	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.20	11.20	80.8	80.8	80.8	85.1
Sardines, Calif., tom. pack,No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	9.00	9.00	105.0	105.0	97.4	81.7
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	cs.	7.95	7.70	84.6	81.9	81.9	89.9

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

The market for canned fishery products was firm in January 1957 with prices unchanged from the previous month, except for an increase of 25 cents a case for Maine sardines. The index for this subgroup for January 1957 was less than 1 percent below January 1956. The California sardine canning season ended January 31 with a poor pack. The only extensive fish canning in January 1957 was by the California canners.

International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

HALIBUT SEASON FOR 1957: The International Pacific Halibut Commission announced February 1, 1957, that:

(1) The opening date for the 1957 Pacific Halibut season shall be May 1, in all areas.

(2) There shall be one fishing season in Areas 1A and 3B extending from May 1 to October 15, without catch limits.

(3) There shall be two fishing seasons in Area 2 as in 1956. The catch in the first season shall be limited to 26.5 million pounds. The second fishing season in Area 2 shall begin on July 29, for a period of at least 7 days with no catch limit. In the event there is a significant deficiency in the catch limit taken during the first season in Area 2, the Commission may increase the length of the second season by announcement prior to the second opening.

(4) Area 1B shall have two fishing seasons, identical to those in Area 2 and without catch limits.

(5) There shall be one fishing season in Area 3A, with a catch limit of 30 million pounds. With this limit the stocks in this area can be fully utilized in this single season under the present plan of fleet operation, and the fleet will be thus afforded opportunity to fish in Area 3B.

(6) The fishing areas shall be the same as in 1956. These are as follows:

Area 1A - South of Heceta Head, Ore.

Area 1B - Between Heceta Head and Willapa Bay, Wash.

Area 2 - Between Willapa Bay and Cape Spencer, Alaska.

Area 3A - Between Cape Spencer and a line running southeast one-half east from Kupreanof Point, near Shumigan Islands.

Area 3B - All waters west of Area 3A including Bering Sea.

JAPANESE-RUSSIAN NORTH PACIFIC FISH COMMISSION MEETING

The date of the meeting between delegates to the Japanese-Russian Fish Commission, scheduled to meet in Tokyo on December 30, 1956, was advanced to the latter part of January 1957. The Soviet delegation will be headed by A. M. Kutareff, an official of the Ministry of Fisheries, and not by A. A. Ishkov, Minister of Fisheries, as originally planned. Other Soviet delegates to the meeting will include 3 commissioners and 8 advisors. The head of the Japanese delegation will be Ishitaru Ide, the new Japanese Minister of Agriculture and Forestry.

The Japanese were disappointed by the postponement in the date of the meeting and also by the change in the chief of the Soviet delegation. Several months are required to make plans for the Japanese North Pacific salmon fishery and any delays on the part of the Russians are apt to be costly.

The most important of the decisions to be arrived at during the conferences is the salmon quota for the 1957 fishing season in the Northwest Pacific Convention area. The Japanese are hoping for a minimum quota of 150,000 metric tons.

NORWAY-CZECHOSLOVAK TRADE AGREEMENT FOR 1957 INCLUDES FISHERY PRODUCTS

A Protocol to the March 20, 1947, trade agreement between Norway and Czechoslovakia was signed in Oslo on November 29, 1956, for the calendar year 1957. Exports from Norway to Czechoslovakia will include the following fishery products: fish oils, refined and for technical purposes, 4,400 metric tons; medicinal cod-liver oil, 600 tons; fresh, frozen, and salted herring, 15,000 tons; fish fillets, 2,500 tons; various fish, including mackerel and tuna 2,500 tons; canned fish, 500,000 kroner (US$70,000); fish meal 1,000 tons; and pearl essence, 100,000 kroner (US$14,000).

SPECIAL COMMITTEE ON OCEANIC RESEARCH

At the international conference of oceanographers held in Gothenburg January 15-18, 1957, an organization (Special Committee on Oceanic Research) was established to conduct joint international oceanographic research.

The new organization will be directly interested in oceanic research from all scientific points of view, including geological, geographical, biological, and physical aspects. The members will be very carefully selected. During the discussions it was emphasized that the organization will need scientists combining the necessary scientific qualifications with a great amount of initiative. The members should also be able to raise the money needed to carry through the program.

An American scientist, Dr. R. Revelle, has been named president of the new organization, and the vice presidents are Dr. M. N. Hill, England, and Professor L. Zenkevitj, Soviet Union. On September 3-14, 1957, the oceanographers will again convene (in Toronto) in conjunction with a meeting of the International Union for Geodesy and Physics, a January 21 dispatch from the United States Embassy at Gothenburg points out.

In a press interview, L. Zenkevitj, the leader of the Soviet delegation, stated that Soviet oceanographers have made extensive preparations for their participation in the geophysical year. Some 15 vessels, he said, are being equipped and will serve as a permanent fleet for research in the Atlantic, Pacific, and Indian Oceans and in the north and south polar regions. The Soviet, he said, are very much interested in carrying out biological research and he recommended that expert biologists be attached to the expeditions for the purpose of studying plankton samples and bird and mammal life at sea. He stressed, however, that he was not referring principally to the cultivation of algae and plankton, but rather to increasing the yield of food products obtained from the sea, mainly by intensified fishing. There are, he pointed out, enormous areas, particularly in the southern hemisphere, where there is no fishing at all.

A number of the delegates to the Conference met on two additional days at the request of an American delegate, Dr. Roger Revelle, head of the Scripp's Institute of Oceanography in California, who stated that at the request of the United Nations he wished to convene the delegates for a discussion of oceanographic and marine biological viewpoints on radioactive waste in oceans with special emphasis on the influence of radioactive particles on commercial fishing.

Also, special attention was given by the conference to research work during the geophysical year when the Indian Ocean will be studied most thoroughly.

WORLD PRODUCTION OF MARINE OILS

World production of marine oils in 1956 was estimated to have increased from 1955 along with the other four categories of fats and oils. World production of all fats, oils, and oil-bearing materials in calendar year 1956 was estimated at 30.5 million short tons, oil equivalent, reports the January 28 issue of Foreign Crops and Markets of the U. S. Department of Agriculture.

Marine Oils: Estimated World Production, Averages 1935-39 and 1945-49, Annual 1950-56

Commodity	1956 1/	1955	1954	1953	1952	1951	1950	Average 1945-49	Average 1935-39
				(1,000 Short Tons)					
Whale	425	420	455	420	460	435	425	280	545
Sperm whale	110	100	75	55	85	120	55	40	30
Fish (incl. liver)	520	515	525	455	450	474	375	275	480
Total	1,055	1,035	1,055	930	995	1,029	855	595	1,055

1/ PRELIMINARY.

Output of marine oils in 1956 increased from 1955 by an estimated 2 percent, reaching 1,055,000 short tons, the same as production in 1954 and in the prewar period. Whale oil output increased slightly with a somewhat larger production from the whale catch in the Antarctic during the 1955/56 season. The sperm whale oil outturn increased an estimated 10 percent with the most pronounced expansion accounted for by Japan. Indications are that production of fish oils in 1956 also was slightly larger than in 1955 due principally to increases in Norway and the United States, the two major producers.

Aden

FISHERY RESOURCES: The sea along the South Arabian coast is considered to be a rich fishing ground, but the antiquated methods and equipment of the local fishermen limit the catch. A small program of assistance to the Eastern Aden Protectorate fishermen was inaugurated last year with the appointment of a fisheries officer.

The principal catches are tuna, which is canned by a small factory in Mukalla and exported to the hinterland and (via Aden) to Italy, and sardines which are used as camel fodder and fertilizer for tobacco crops. Fish oil and dried fish are also exported, and fish is an important source of food for the coastal villages, points out a January 28 dispatch from the United States Consulate at the city of Aden.

Angola

NEW FISHERY BYPRODUCTS PLANT: A new firm has been formed at Porto Alexandre, Angola, reportedly to erect a fish oil and fish meal factory in the locality known as Santo Antonio. Preliminary work has started and the pier for loading and unloading has already been constructed. Machinery is being installed to process 150 metric tons of fresh fish daily. Centrifuges will be installed to concentrate the stickwater. The cost of this factory, including installations for personnel, will be between 13,000-14,000 contos (US$450,000-487,000), a January 7 dispatch from the United States Consulate at Luanda states.

Australia

1956/57 SPINY LOBSTER SEASON IN WEST AUSTRALIA OPENED IN NOVEMBER: When the 1956/57 spiny lobster fishing season opened on November 15 in West Australia, an estimated 150 fishing boats put to sea to catch the white spiny lobsters which abound on the sandy ocean bottom during the first two weeks of the season. As the white ones disappear, the fishermen shift their pots to the reefs and rocky bottoms where red ones may be caught during the balance of the season.

The number of boats in the fleet is up about 25 from last year. This has caused new worries among conservationists that the grounds may be fished out. In an experimental move to protect the younger spiny lobsters in shallow coastal waters, the State Government will ban the catching of spiny lobster, whether by professional fishermen or amateur skin divers, in waters within one mile of a 150-mile strip of coast north from the vicinity of Perth, during the period from January 15 to November 15, 1957.

West Australian exports during the 1955/56 season, as reported by the Commonwealth Government, totaled 3.6 million pounds, over 75 percent of the Australian total. The United States was the principal purchaser, and higher wholesale prices approaching $1 a pound late in the year improved total earnings despite lower production.

British Guiana

SHRIMP EXPLORATIONS OFF COAST: A United States firm is reported to be searching for shrimp in the coastal waters of British Guiana, according to Foreign Trade, January 19, 1957, published by the Canadian Department of Trade and Commerce.

The United States firm's fleet of three fishing vessels and a mothership for processing and storing the catch is operating out of Georgetown. Although shrimp have been caught in many areas, the catches so far have not been large enough for a profitable large-scale shrimp fishery.

Brazil

RECIFE AREA TO HAVE NEW FISHING COMPANY: A new fishing company will be established at Recife in January 1957, according to newspaper reports transmitted in dispatches dated January 2 and 8 by the United States Consul at Recife. It is expected that the new firm will assure an adequate supply of fish for Recife and other cities in Northeastern Brazil.

The firm will have a capital of Cr.$10 million (about US$153,000) and two fishing vessels. It will process, distribute, and also can the surplus. It is believed that the Japanese vessel Kaiko Maru, which has been supplying fish to Recife for about five months, will be sold to the new firm.

Due to the efforts of Japanese fishing vessels operating in northeastern Brazil waters, Recife has enjoyed a plentiful supply of tuna at reasonable prices.

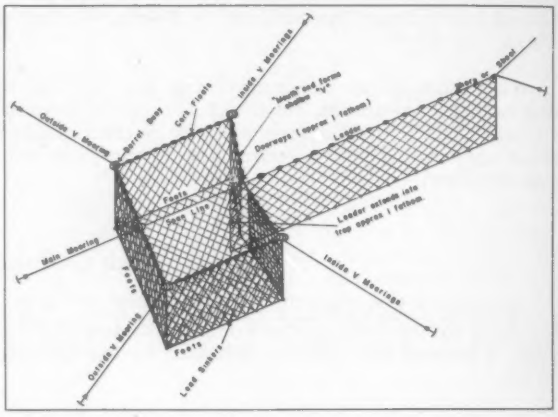
Canada

NEWFOUNDLAND COD TRAP: The boxlike trap, developed some 90 years ago by a Newfoundland fisherman operating at Bonne Esperance in the Strait of Belle Isle, annually accounts for a large proportion of the landings of cod by Newfoundland fishermen, particularly on the east coast.

Although all cod traps are basically the same in type of construction, they vary widely in size, ranging from as small as 35 fathoms on the round to extra large ones of 84 fathoms.

Traps are set out in the inshore waters with the leader end moored close to the shore or a reef. Cod swimming by thus are diverted into the door of the trap. Once inside the cod are still free to leave by the doorway, but they are discouraged from doing this by the "lay" of the front walls which slant inwards to the doorways.

In setting out the cod trap, the fishermen first place the framework of ropes with the anchors and buoys in position and attach the mesh sides and floor afterwards. In hauling them the mesh is pulled in so that the fish are "dried up" at the back of the trap or in one of the back corners, depending on the tide.



NEWFOUNDLAND COD TRAP IN FISHING ORDER.

Although other, more mechanized methods are gradually achieving a measure of popularity throughout Newfoundland, the cod trap continues to be a prolific producer during the summer season when vast shoals of cod swarm into Newfoundland's close inshore waters.

Costs of traps show a considerable variation, depending on the size, where they are made, the length of the leader, etc. A typical 60-fathom trap ranges from about $1,400 to $1,800, and those around 84 fathoms may cost as high as $3,000.

An important feature of the cod trap is that it is movable. Thus, if fishing proves to be unproductive in one spot the fisherman can shift it to another berth (Trade News, December 1956, a publication of Canada's Department of Fisheries).

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SASKATCHEWAN COMPLETES FILLETING AND FREEZING PLANT: In order to enable the fishermen of Saskatchewan's Wollaston Lake to take advantage of the full fish resources of the lake, the Province's Department of Natural Resources completed a $75,000 fish filleting and freezing plant in the fall of 1956. Wollaston Lake is in the Northeast corner of Saskatchewan.

The new plant has a storage capacity of 150,000 pounds of frozen fish, a freezing capacity of 600 pounds an hour, and can manufacture 5 tons of flake ice in 24 hours. The fishermen on the Lake are expected to double their present catch to reach the full annual limit of about 825,000 pounds (Saskatchewan News, issued bimonthly by the Saskatchewan Provincial Government).

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CONSTRUCTION SUBSIDY EXTENDED TO LARGER VESSELS: The Canadian program for financial assistance in the construction of fishing draggers and trawlers, previously limited to boats under 65 feet in length, was extended to the larger vessels of the Atlantic Maritime provinces effective January 1, 1957, according to an announcement by the Canadian Minister of Public Works on December 3, 1956.

Cuba

CANNED MACKEREL MARKET: No canned mackerel is produced in Cuba and there is very little demand for this product, a January 24 dispatch from the United States Embassy in Havana states.

The current consumption trend is static, with only an occasional lot of mackerel imported from the United States. In 1955 mackerel imports totaled 2,515 cases (valued at $17,795).

A few importers maintain a small inventory of canned mackerel as an accommodation for customers. Several Havana area grocery stores, of the type generally patronized by the local population, were visited and none carried canned mackerel in stock. Some were wholly unfamiliar with the product and others indicated that they either never maintained or had discontinued the item because of lack of demand.

While unwilling to give encouragement that a significant market can be developed, trade sources indicated a preference for 15-ounce ovals packed in tomato sauce. These sources reported that current imports are almost completely in 15-ounce cans and natural medium, and that there is about equal division between tall and oval cans. Retail prices for the 15-ounce cans range from 25-35 U.S. cents a can.

Authoritative sources are uniformally pessimistic about developing a significant market for canned mackerel in Cuba. The principal reasons cited are the long well-established preference for sardines and other fishery products generally accepted in Cuba, together with a dislike of the taste and texture qualities of mackerel.

On the basis of the current situation, it seems clear that significant expansion of the Cuban market for canned mackerel would require: the development of interest on the part of distribution outlets that could be induced to conduct aggressive promotion campaigns and sales efforts; the ability to price canned mackerel so that it would be distinctly advantageous in relation to other low-priced fish and meat products; and the use of a tomato or other acceptable tasteful packing medium.

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NEW FISHING REGULATIONS: New regulations governing the fishing industry of Cuba published in Official Gazette No. 206 of October 23, 1956, as Decree No. 2724 of October 5, 1956, supersede those contained in Decree No. 973 of May 8, 1939, and conflicting provisions of subsequent decrees. The new regulations made necessary by the establishment of the National Fisheries Institute under Law-Decree 1891 of January 11, 1955, do not make any significant change in the regulations and practices of the Cuban fishing industry.

The provisions are based upon State ownership of the marine resources, and the reservation of rights, except for sport fishing, to Cuban citizens. All persons engaged in the fishing trade must be registered in a General Registry of Fishermen to be maintained by the National Fisheries Institute. The Institute also is to main-

tain a General Registry of Fishing Vessels. License fees prescribed for commercial fishermen, fishing vessels, merchants, and processors are payable to the Institute for general use in accordance with its broad authorities. No fees or licenses are required for sports fishing, although vessels must be registered and such fishing must be in accordance with the general regulations.

The regulations also cover in detail such aspects as open and closed seasons, size and quantity limitations, legal and prohibited equipment and methods, sale and transportation, conservation and propagation, enforcement authorities, and other subjects. Full reports including statistics on catch are to be furnished after each fishing trip before a vessel may be cleared for a subsequent trip.

Ecuador

CANNED MACKEREL MARKET: No present opportunity exists for imports of canned mackerel into Ecuador, states a January 8 dispatch from the United States Embassy at Quito. The principal obstacle is the high tariff of 18 sucres (slightly less than US$1.00) per kilo (about 45 U.S. cents a pound), plus 20 percent ad valorem. When the various taxes on imports and the usual dealer markups are added to this, the result would be a retail price for canned mackerel beyond the reach of all but a tiny fragment of the population.

There is no domestic production of canned mackerel in Ecuador. Statistics on imports are not readily available, but it is believed that they have been negligible or nonexistent. Canned fish imports generally have had little success in Ecuador, with the exception of sardines and to a lesser extent salmon, shrimp, and tuna, states a January 8, 1957, dispatch from the United States Embassy in Quito.

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FISH FREEZING AND REDUCTION PLANT COMPLETED: A small pilot plant for freezing fish and manufacturing fish meal was completed at Manta, Ecuador, under the direction of a Food and Agriculture Organization technician, a December 19, 1956, dispatch from the United States Embassy in Quito reports.

El Salvador

CANNED MACKEREL MARKET: There is a good market in El Salvador for canned mackerel, according to a dispatch (January 23, 1957) from the United States Embassy at San Salvador. That portion of the population which can afford to purchase canned mackerel finds it an inexpensive food, attractive to its taste.

There is no production of canned mackerel in El Salvador. There is a good demand for this product because of its modest price and high protein content. The demand is fairly stable throughout the year, possibly reaching a high point during the Easter season, which is traditionally a highly festive one.

The most popular size can is the 15-oz. oval, which is estimated to account for 85 percent of the importations. About 10 percent of the pack is in the natural state, and 90 percent is in tomato sauce.

Current retail prices for canned mackerel in San Salvador are as follows: 15-oz. oval and tall, 30 U.S. cents; 8-oz. square, 20 cents; and 6-oz. tall, 12 cents.

All kinds of fish are grouped together in the import statistics; therefore, it is possible only to estimate what proportion may be canned mackerel. On the basis of trade comment, it is estimated that about 1,247,467 pounds of canned mackerel were imported in El Salvador in 1955 as compared with 1,403,320 pounds in 1954. Of this total 1,240,054 pounds were imported from the United States in 1955 and 1,381,984 pounds in 1954.

The United States enjoys a tariff preferential under the terms of the trade agreement of 1937, which specifically lists canned mackerel (and salmon) at US$5 per 100 kilograms (2¼ U.S. cents a pound), compared to the regular rate of US$29 per 100 kilograms (13 U.S. cents a pound). The preferential rate, however, is enjoyed by a number of other countries as well, so that the large importation of United States mackerel cannot be ascribed to the tariff preferential alone.

It is believed that there is a good prospect for continued importations of United States canned mackerel and possibly an opportunity for expanding sales still further.

France

FISHING FLEET: In 1953 France's fishing fleet was already beginning to discard its very old vessels.

The wooden fleet of fishing boats in 1953 showed a uniform increase in boats of higher tonnage and a steady disappearance of boats of lower tonnage.

In 1953, France's fishing fleet numbered some 1,504 units of 25 tons and over with a total tonnage of 159,937 tons. However, 306 of these vessels were over 20 years old. In July 1956 the fishing fleet consisted only of 1,274 units with a tonnage of 154,952 tons. But only 140 of the vessels were more than 20 years old.

France's Fishing Fleet by Tonnage, 1953 and 1956

Year	25 to 50 Tons		50 to 75 Tons		75 to 100 Tons		Over 100 Tons		Total	
	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage
1956	630	22,022	253	15,612	101	6,723	290	110,595	1,274	154,952
1953	839	30,114	300	18,068	82	6,850	283	104,905	1,504	159,937

Thus from January 1953 to July 1956, France's "deep-sea" fishing fleet while losing 15.3 percent of its units, lost only 3 percent of its tonnage (see table). Also, the percentage of old boats fell from 21 percent to 11 percent.

The number of vessels of less than 25 tons each in the fleet significantly declined, mainly through the loss of boats over 20 years old. Port by port, the rapid disappearance of boats over 20 years old took place largely in the ports with numerous sail-bearing tuna boats. Thus Concarneau, Lorient, Groix, Etel, and La Rochelle lost a total of 169 units. On the other hand, an increase was noticeable in those ports where little drag-net fishing is carried on such as the Bigoudene peninsula and Sables-d'Olonne. An increase also took place at Saint-Jean-de-Luz where the small sardine boat is being replaced by the small tuna boat. At Camaret there was a decrease due, no doubt, to the disappearance of lobsters in the nearby waters.

The 50- to 75-ton category was relatively stable. Although the number of vessels increased in Concarneau, in Groix, and at l'Ile d'Yeu, the number declined in Lorient and La Rochelle.

An increase in the 75- to 100-ton category took place, but there was stability in the category of vessels over 100 tons. There were only 7 more such units in

1956 than in 1953, but the total tonnage increased. In 1953, the metal vessels of over 100 tons comprised 239 units with a total tonnage of 98,334. The wooden vessels of over 100 tons comprised 44 units with a total tonnage of 6,571 tons. In July 1956 there were 50 wooden vessels of more than 100 tons each.

To the 100-ton and over category, 64 new boats have been added since 1953; to the 75- to 100-ton category, 32; to the 50- to 75-ton category, 61; to the 25- to 50-ton category, 195. These new units add up to 352.

Trawlers: "True" trawlers comprise alone nearly half of France's deep-sea fleet--628 units with a total tonnage of 123,129 tons. Of the trawlers, 29 displace over 1,000 tons and 12 displace between 500 and 1,000 tons. These vessels are all of the standard single-purpose type, except for two which are dual-purpose refrigerated-salting vessels.

Trawlers between 250 and 500 tons number 87 units with a tonnage of 31,058 tons. This is a "young" fleet. Only 7 of the vessels are over 20 years old and, of course, even a twenty-year old trawler is still very valuable if it has been kept in good condition.

Trawlers between 100 and 250 tons total 135 units with a tonnage of 22,587 tons. This fleet has been largely rejuvenated--only 30 of the vessels are more than 20 years old and 21 new units have been added. The boats of near 250 tons are being equipped with more and more powerful motors so that they may trawl to greater and greater depths. No doubt wooden boats will continue to enter the fleet, but this is becoming rarer; steel boats, which are more readily insurable, are taking over.

Trawlers between 75 and 100 tons, entirely wooden, number 88 units with a total tonnage of 7,550 tons. It is classed as a semideep-sea fleet and continues to be very valuable. These vessels, around the year 1934, brought a new approach to trawling. The present fleet has five units of over 20 years which may, incidentally, be definitely considered as average--a wooden vessel over 20 years old in full operation is a doubtful asset. But on the other hand, the fleet has received 23 new units over a period of 5 years.

Trawlers of 50-75 tons comprise 93 units, all wooden, with a total tonnage of 5,954 tons. The category is popular among ship owners in small ports and has received 21 units in the last five years.

Trawlers between 25 and 50 tons (this category has the greatest number of units) total 184 units with a tonnage of 6,402 tons. It has been heavily reinforced (56 new units in the last five years) and has been the target of violent criticism.

Trawler-Tuna Vessels: There has been added to the fleet of "true" trawlers, a fleet of trawler-tuna vessels (the conversion of tuna boats into trawlers). The fleet numbers 327 units with a total tonnage of 13,628 tons. It may be divided into the following categories; 25 to 50 tons, 248 units (tonnage 8,309); 50 to 75 tons, 69 units (tonnage 4,291); 75 to 100 tons, 7 units (tonnage 685); more than 100 tons, 3 units (tonnage 343).

Of these 327 units, 97 are less than 5 years old. This type of vessel is very popular in France. This fleet has 29 vessels equipped with live-bait wells.

Tuna Vessels: "True" tuna vessels theoretically number 193 units with a tonnage of 9,290 tons. The name, however, is somewhat arbitrary, for many of the units fish other species, too, such as mackerel, etc.

Actually the fleet consists of 58 "true" tuna boats using live bait, 6 of which are more than 100 tons, and 22 sail boats which have been condemned and will soon disappear from the fleet. Besides 58 "true" tuna boats and 22 sail boats, there are 113 "multi-purpose" boats of which 13 are equipped with bait wells.

The success of the vessels working with live bait will no doubt cause several dozen boats from among those which are not too old or too small to be equipped in this manner ("multi-purpose").

Lobster Boats: France's lobster fleet of over 25 tons is made up of 84 units with a total tonnage of 2,929 tons. Of the total, 17 fall between 50 and 75 tons and 52 between 25 and 50 tons. The tendency of units of less than 5 years is unmistakeably in the direction of high individual tonnage which increases the vessel's range of operations.

Mackerel-Sardine Vessels: This fleet consists of an equal number of mackerel vessels and an equal number of herring vessels with a total of 43 units: 37 units, 25-50 tons; 13 units, less than 5 years old; 29 units between 5 and 20 years old.

There is little probability that this type of vessel will increase in number in the future in view of the difficulty in working them--even though their cost is not too high.

New Vessels: Plans, orders, and vessels under construction with a tonnage of 50 tons and over call for 173 units whose total tonnage is 30,342 tons. These consist of 113 trawlers (tonnage 23,000 tons), 32 trawler-tuna vessels (tonnage 3,110 tons), 21 tuna vessels (3,376 tons), and 7 lobster boats (855 tons).

NOTE: ABSTRACTED FROM THREE ARTICLES WHICH APPEARED IN THE WEEKLY FRENCH PERIODICAL LE MARIN OF NOVEMBER 2, NOVEMBER 23, AND DECEMBER 7, 1956. TRANSLATED BY R. DUCKWORTH.

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1956 SARDINE LANDINGS AT RECORD HIGH: The French sardine fishermen in 1956 were expected to land more than 40,000 metric tons. By November 13, 1956, a total of 38,250 tons had been recorded in Atlantic port landings and 2,500 tons in Mediterranean port landings.

Thus the previous record, established in 1934, was broken. In that year some 25,000 tons of sardines were landed between Camaret and St. Jean-de-Luz.

The canning plants processed a total of 33,000 metric tons thus also exceeding their former records for the amount processed. From the standpoint of trade outlook, there seems to be no reason to fear an oversupply of the market, the French periodical Le Marin of November 23, 1956, stated.

But offsetting the increase in sardine landings, was a decrease in mackerel and herring landings.

Tuna landings in 1956 reached 16,150 tons.

Guatemala

SHRIMP RESOURCES UNEXPLORED: Regarding the existence of shrimp resources off the coasts of Guatemala, the Hunting and Fishing Section of that country's Ministry of Agriculture points out that to date no technically-directed exploration has taken place by any institutions, private or governmental, for the purpose of establishing the location of shrimp beds or other marine resources of commercial importance. A few sporadic catches, have been the basis for the opinion that marine fishery resources do exist. Very few scientific investigations have been made regarding the life history of the predominant species and the extent of exploitable resources.

Notwithstanding such a scarcity of data, according to license applications processed by the Section of Hunting and Fishing, various persons, acting individually or in groups, have planned to establish shrimp fishing companies on one or both coasts. According to the Ministry, however, none have actually been established, a January 30 dispatch from the United States Embassy in Guatemala announces.

The Section of Hunting and Fishing states that one factor which had probably impeded the growth of the shrimp fishing industry in Guatemala was the complete absence of boat shelters along Guatemala's Pacific coast.

The firm view was expressed that the shrimp beds do exist along the Guatemalan shores. One report indicated that sometime ago a fleet of Mexican shrimp boats caught substantial quantities of shrimp in a five-day period from beds along the Guatemalan Pacific coast near the El Salvador border. The shrimp in this area were said to be blue shrimp, running about 8 or 9 to the pound heads on.

Guatemalan fishermen generally do not engage in shrimp fishing, but they might very well turn their attention to this resource if a good market for it developed.

Anyone desiring to organize a fishing company should request the Ministry of Agriculture for permission to undertake marine explorations in Guatemalan littoral waters. This request may be granted with the proviso that, if the results demonstrate possibilities for investing necessary capital, the Government will exempt the company from paying duties, assessments, contributions, and excise taxes during a period agreeable to both parties. In case the results are negative, the Government will agree to pay part of the expense incurred, on the understanding that such explorations should be undertaken by a qualified person or entity, that it should operate under the control of Inspectors paid by the Ministry of Agriculture, and that the data obtained, in any case, will be placed at the disposition of the Government. In case there is interest in obtaining information officially, a request should be made in writing to the Ministry of Agriculture of the Government of Guatemala.

Hong Kong

SHRIMP CATCHES DECLINE: The greatly expanded fleet of motor shrimp trawlers fishing for shrimp out of Hong Kong has resulted in depletion on the known shrimp grounds. The fishing areas have been extended, both east and west, but the catches per boat have been low. Many of the larger shrimp trawlers either turned to pair fishing for finfish, hauled out in September and prepared for the gillnetting season for yellow croakers, or turned to trawling for bottom fish (United States Consulate in Hong Kong, January 3 dispatch).

India

TERRITORIAL WATERS LIMIT ESTABLISHED: In a proclamation by the President of India (Territorial Sea Belt), dated March 22, 1956, and published in the Gazette of India, the territorial waters of India are established at six nautical miles measured from the appropriate base line.

The proclamation states that due to the lack of uniformity in international practice regarding extent of the sea belt known as territorial waters of the State, a declaration is necessary to establish the extent of the territorial waters of India.

Japan

FISHERIES REPRESENTATIVES TO VISIT RUSSIA: The National Fisherman's Council, a private organization of independent fishermen, is organizing a team of representatives from the Japanese fishing industry to visit Russia in the spring of 1957 in response to an invitation received in October 1956 from the Central Council of the Soviet Food and Industry Union. The team, numbering 7 or 8, is expected to be named late in January and will probably include representatives from the processing and marketing ends of the industry as well as fishermen. Present plans for the visit include (1) a survey of fish conservation facilities, (2) a study of Soviet fishing methods, and (3) an exchange of technical information. The group will spend two months inspecting fishing installations and studying methods in Kamchatka, Sakhalin, and the coastal areas of Siberia, and another month in Moscow, a United States Embassy dispatch (January 11) from Tokyo states.

The Japanese fishing industry is very anxious to establish friendlier relations with the Soviet Union on fisheries matters in the hope that some of the unpleasant and costly incidents of the past can be avoided in the future. Furthermore, the Japanese are handicapped in their relations on fisheries matters with the Soviet Union by a lack of information on the Soviet fishing industry and the extent of conservation being undertaken, especially in relation to salmon fishing. It is expected that the Japanese will extend an invitation to a similar Soviet group to visit Japan.

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INVESTMENT IN UNITED STATES TUNA SPECIALTY FIRM: One of the big five Japanese fishing companies will invest up to US$1 million in a tuna specialty plant located in Boston, Mass. The Boston firm, which was reported negotiating the purchase of additional facilities in Boston, will manufacture and market various newly-developed tuna products, such as "loaf" and "sausage" and other luncheon meats. It was expected that all legal matters pertaining to the establishment of the firm would be completed by mid-February and the Japanese Government has authorized the necessary foreign exchange.

The Managing Director of the Japanese firm investing in the tuna specialty firm points out that "we are merely investing 'up to $1,000,000' in an American corporation which has the patent rights and special industry 'know-how' for some new tuna products. We shall have the right of voice in the direction of the firm in question but American interests will be predominant therein."

It was also pointed out by the Director of the Japanese firm that the investment in the Boston firm grew out of the need for new markets for tuna and similar fish. He expressed confidence that a market for new tuna products could be developed in the United States and indicated that American tuna firms might eventually participate in the new venture.

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TUNA INDUSTRY PROBLEMS: Since the Japanese have long been aware of the sensitivity of the United States tuna market, the Japanese industry in 1954 imposed voluntary quotas on frozen tuna exports to the United States. At the same time the Japanese Government established check prices on exports to the United States. The check price for albacore from October 1954 through May 1955 was US$300 a short ton f.o.b. Japanese port. From June 1955 to date, the check price for albacore has been $270 a short ton f.o.b. Japanese port. The Japanese contend that the check price had to be reduced because of a heavy catch and a sluggishness in the market. At the current check price, Japanese albacore at a cannery in the United States sells for $315 a short ton, according to the Japanese industry. They state also that American-caught fish is selling at the cannery at $300 a short ton.

The Japanese industry established a voluntary quota of 28,000 short tons for the period April 1, 1956, through March 31, 1957. This is a reduction of 4,000 short tons from the quota originally established for this period. Japanese exports to the United States of frozen albacore and other tuna and tunalike fish are shown in table 1.

Table 1 - Japanese Tuna and Tunalike Fish Exports to the United States, 1952-56 1/

Year	Albacore	Yellowfin	Skipjack	Big-eyed	Total
	(Short Tons)				
1956 (Jan.-Nov.)	20,284	26,870	-	509	47,663
1955	31,574	23,903	60	1,143	56,680
1954	30,537	18,915	2,995	1,404	53,851
1953	31,609	6,273	606	388	38,876
1952	19,840	3,491	692	-	24,023

1/ Same as in Table 2.

A tuna boat association has filed a brief with the U. S. Treasury Department alleging that Japanese albacore was dumped on the United States market during the latter part of 1956. The Treasury Department is now investigating these allegations. In connection with the dumping charge, the Japanese Government has prepared detailed cost figures and other statistics which have been submitted to the U. S. Treasury Department. The Treasury Department announced that pending a finding in the case, appraisement will be suspended on all frozen tuna from Japan.

Table 2 - Japanese Canned Tuna in Brine Exports to United States, 1953-56 1/

Year	Standard Cases
1956 (est.)	1,663,000
1955	1,516,000
1954	1,406,000
1953	1,518,000

1/ Japanese export figures will vary somewhat from United States import records due to differences in rate of export from Japan and time of arrival in United States.

In addition to frozen tuna, the Japanese export canned tuna in brine to the United States but limit shipments in any one year to 17-18 percent of the total United States pack during the previous year. By limiting the quantities exported to less than 20 percent of United States production, Japanese canned tuna in brine enjoys the minimum duty. The duty increases from 12½ percent to 25 percent when imported quantities exceed 20 percent of the previous year's United States pack. Table 2 shows exports to the United States of Japanese canned tuna in brine for the years 1953 through 1956.

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SURVEY SHIP FINDS RICH FISHING GROUNDS OFF BRAZIL: The Japanese survey ship Toku Maru (left Japan on October 20, 1956, to survey the fisheries resources off the coast of Brazil) was reported to have discovered rich fishing grounds at 22° S. lat. and 18° W. long. (about 1,300 miles east of Brazil). Tuna, marlin, and other species were reported to have been found in large numbers, a January 4, 1957, dispatch from the United States Embassy in Tokyo reports.

The Toko Maru is scheduled to continue surveying the areas off the coasts of South and Central America and if results are favorable the Japanese Fisheries Agency is hopeful that joint fishing arrangements can be worked out with Brazil, Argentina, Chile, Dominican Republic, and Mexico. Recently, however, Mexico rejected a request to send Japanese fishing vessels into Mexican territorial waters.

Japanese fishing firms during the past several months have entered into joint fishing ventures with foreign firms in Burma, Ceylon, India, Vietnam, Philippines, Brazil, China, and other countries. The Japanese Fisheries Agency has encouraged Japanese firms to seek new fishing grounds and has sent survey ships to Southeast Asia and South America to explore fishing possibilities.

Republic of Korea

NETTING INDUSTRY EXPANDING WITH UNKRA-IMPORTED MACHINES: With net-making machines imported by the United Nations Korean Reconstruction Agency now in operation, Korean fishermen will be able to spend less time in mending old fish nets and more in fishing. The acute shortage of nets, first caused by the intensive war damage suffered in Korean ports, has been increased in the last few years by UNKRA's program of aid for the fishing industry.

Under UNKRA projects the fishing fleet has been restored and expanded; private firms have been given loans to help them to build more boats; and ice plants, canneries, and fish markets have been reconditioned or constructed to handle the catch.

However, net manufacturers, with only 50 percent of the machinery they needed, were unable to keep up with the revitalized industry. Consequently, fishermen still had to patch and sew to hold together the remnants of their nets, and their catch was limited by the inadequacy of their equipment.

To meet part of the immediate requirements UNKRA brought in 330,287 pounds of trap, shore-drag, anchovy, gill, mackerel, purse-seine and shrimp-trawl nets valued at US$284,548.

This aid was followed by machinery imports to help the net-manufacturing companies to step up production to a level consistent with the development of the industry they supply.

Under this $100,000 program, eight companies operating in the fishing centers of Chung Moo City, Samchon Po, Pusan, Samchock, Changhang, and Seoul have received and put into operation 36 net-making machines and 10 winders, and Korean fishermen can once more buy Korean nets.

Mexico

FISHERY COOPERATIVES ELIGIBLE FOR LOANS: During 1957 about 9 million pesos (US$720,000) will be made available through the National Cooperative Development Bank of Mexico for loans to fishery cooperatives. In addition, the fishery cooperatives will be permitted to borrow for the first time from private banks. The loans will be for the purchase of boats and gear.

The 147 Mexican fishery cooperatives with 15,000 members have the exclusive right to fish for shrimp, abalone, lobsters, oysters, totoaba, cabrilla, and pismo clams (U.S. Embassy in Mexico City, dispatch dated January 22).

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LARGEST FISH CANNERY DESTROYED BY FIRE: The El Sauzal fish cannery and reduction plant near Ensenada, Baja Calif., was destroyed by fire on December 3, 1956. It is reported that the establishment was completely razed with the exception of the landing pier. The loss is estimated to be between 15-20 million pesos (US$1,200,000 to $1,600,000). Of the 46,000 cases of canned fish (mostly California sardines) damaged, probably 10,000 cases can be salvaged.

The cannery, the largest fish cannery in Mexico, was one of four plants in or near Ensenada packing sardines and mackerel principally for consumption within Mexico. It is not anticipated that the destruction of the plant will cause a shortage

of canned sardines in Mexico, the United States Embassy in Mexico City reports in a dispatch dated December 7, 1956. The 1956 season has been a good one for sardines and canned supplies are plentiful. It is understood that reconstruction will begin immediately and will require 4 or 5 months to complete. The first 5 months of the year generally are not particularly good for sardines. While the new plant is under construction, the canning facilities of another cannery in Ensenada will be used.

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PLANES FOR COASTAL PATROL PURCHASED: The purchase of five Catalina flying float planes for fishery patrol on both the east and west coast of Mexico was announced by Mexico's Minister of Marine. Two planes will be assigned to the coastal area of the Gulf of Mexico and three to the Pacific Coast for border to border patrol, states a December 13, 1956, dispatch from the United States Embassy in Mexico City.

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SHRIMP CATCH DOWN IN JANUARY 1957: The catch of shrimp by Mexican fishermen during January 1957 was estimated to be only about half that produced in January 1956. The catch on the east coast or Gulf of Mexico area was higher, but the west coast catch was much lower, states a February 13 dispatch from the United States Embassy in Mexico.

Shrimp vessels fishing out of Guaymas were reported to be having difficulty catching from 1 to $1\frac{1}{2}$ metric tons a trip. The fleet out of Mazatlan had better luck, but the catch was running to small brown shrimp (40 or more to the pound). At the end of January some of the Mazatlan shrimp vessels were fishing in depths as deep as 80 fathoms for the so-called brown shrimp (actually the pink shrimp, Penaeus brevirostris).

At the end of the month, about 50 trawlers and 2 freezerships from Guaymas and Mazatlan were en route or about to leave for Salina Cruz on the Gulf of Tehuantepec.

New Zealand

CANNED MACKEREL MARKET: Canned mackerel are not produced in New Zealand and no statistics are available on consumption of this product, reports a United States Embassy dispatch (January 15, 1957) from Wellington. Retailers and importers in Wellington indicate, however, that while a small amount of canned mackerel has been marketed in the past, especially during periods when supplies of other types of fish were short, the product at present has practically disappeared from the market.

New Zealand consumers tend to regard canned mackerel as a coarse and inferior product in comparison with, for example, herring. At present canned mackerel would stand in relation to canned herring about as margarine (in New Zealand) stands in relation to butter. This is quite a strong statement since margarine has won practically no consumer acceptance in New Zealand. Earlier attempts to introduce canned mackerel in New Zealand have failed, and it is believed in the trade that future attempts would also fail unless an attractive price were combined with a very considerable amount of advertising to overcome consumer resistance.

All types of canned fish are free of import licensing control from all sources, including the dollar area. Accordingly, governmental regulations would be no bar to the development of the market. The tariff rate applicable to canned fish when imported from the United States, or any other most favored Nation, is 2.5 pence (2.9 U.S. cents) a pound.

New Zealand is a relatively small market (slightly over 2 million population as of the April 1956 census), but the country has a high standard of living. Important amounts of canned fish are imported--a record 7 million pounds entered in 1955. Imports were at a lower level in the first part of 1956 than in the previous year, but totals for the year will probably go well over 5 million pounds. Supplies have been sufficient to satisfy demand recently, and competition in this market would be severe for a product with low consumer appeal such as canned mackerel.

Although the possibilities of marketing canned mackerel in New Zealand are not encouraging, the situation should not be regarded as hopeless. The price of US$5 a case (48-1 lb. cans) f.o.b. Los Angeles or San Francisco would be considered very reasonable. Competing canned fishery products are currently being offered to New Zealand importers at much higher prices.

Anyone wishing to sound out the marketing possibilities will not find the distributive system for such products in New Zealand discouraging. Trade sources stated that three wholesale chains handle a considerable proportion of the foodstuffs retailed. Furthermore, a number of experienced and reliable "indent agents" are available who are willing to handle any attractive lines of United States foodstuffs. These agents act as salesmen in New Zealand for United States firms, selling on a commission basis, or perhaps purchasing direct from United States firms for resale here.

Norway

FISHERIES TRENDS, 1956: Norway's total catch of all fish set an all-time record in 1956 when close to 2.0 million tons were landed, compared with 1.6 million tons during 1955. The ex-vessel value increased from 609.7 million kroner (US$85.4 million) in 1955 to 691.5 million kroner (US$96.8 million) in 1956. Herring accounted for over half of the total catch.

Because of the poor brisling catch, the canning of this fish dropped in 1956 to 197,500 cases from 247,000 cases in 1955. A normal year's pack is 500,000 cases. The decline in the canning of brisling was largely offset by an increase in the canning of herring and shellfish. As a result, exports of all canned fish during January-November 1956 dropped only slightly below the corresponding period of 1955.

Fish industry sources contend that rising costs are leaving the fishermen with less money despite the record year. As a consequence, the price equalization fund is being heavily taxed to make up the difference between fixed minimum landed prices and the lower world market prices at which the fish must be sold.

Close to 30,000 men are expected to participate in the 1957 herring fishing which began in mid-January. In the 1956 season 24,857 men participated. Given good weather, the outlook is an increase over last year's record catch. Capacity has been expanded in the fishing fleet as well as in the handling equipment on shore. Large herring shoals are reported off the Norwegian coast, according to recent United States dispatches from Oslo.

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NORWEGIAN-SOVIET SUPPLEMENTARY TRADE AGREEMENT INCLUDES FISH: Under a supplementary trade agreement signed on February 5, 1957, Norway and the Soviet Russia will exchange during 1957 supplementary deliveries worth about 30 million kroner (US$4.2 million) over the annual delivery total of 105 million kroner (US$14.7 million) fixed in the three-year (1956-58) agreement. Included in the supplementary agreement among other products will be frozen fish fillets.

Negotiations between Norway and the Soviet on the price of 50,000 tons of salt herring to be delivered annually to Soviet Russia under the three-year agreement were still unsettled as of February 8, according to a dispatch from the United States Embassy in Oslo.

Sweden

FISH EXPORT CONTRACTS UNDER SWEDISH-EAST GERMAN TRADE EXCHANGE AGREEMENT: Swedish fish export contracts totaling Sw.Kr. 22.5 million (US$4.3 million) for 1957 under the new merchandise exchange agreement reached between Sweden and East Germany have been negotiated and signed and shipments have commenced, according to the Swedish West Coast Fishermen's Central Association.

The share of the West Coast fishermen in the total export of fish amounts to approximately Sw.Kr. 16,000,000 (US$3.1 million). The West Coast contract includes considerable quantities of fresh and frozen winter herring and Fladen herring as well as salted Fladen herring. Fish fillets are for the first time included in the contract and will comprise fillets of cod, haddock, and saithe (pollock).

The current contracts also provide for certain price increases in comparison with last year, motivated by higher prices of fishing gear and higher costs of living for the fishermen.

Shipments from the South Coast will consist of cod and fillets, a February 15 dispatch from the United States Consul General at Goteborg states.

NOTE: VALUES CONVERTED AT THE RATE OF SW.KR.5.16 EQUAL US$1.

Taiwan (Formosa)

FISHERIES LANDINGS IN 1956 AGAIN BROKE PREVIOUS RECORDS: The 1956 fish production in Taiwan reached 193,410 metric tons. This shattered the record of 180,618 metric tons in 1955 and exceeded the target set in the Four-Year Production Plan by 23,410 metric tons. The catch by categories as compared with the 1955 catch is shown in the table.

Formosa's Fisheries Landings, 1955-56		
Type of Fishing	1956	1955
	..(Metric Tons)..	
Deep-sea	43,988	36,413
Inshore	63,683	51,334
Coastal	43,259	47,175
Fish culture	42,480	45,696
Total	193,410	180,618

Among the four categories of fisheries, deep-sea fishing had, for the first time since 1945, jumped from last place to second place. Increased catches from deep-sea and inshore fishing was the result of (1) a larger number and tonnage of boats, (2) more trips, and (3) a larger catch per trip by some vessels. The poor catch from coastal fishing was caused by the scarcity of sardines (caught by torch fishing) and bonito (caught by set nets). The decrease of

production from fish culture was caused by loss of fish from flooding of fish ponds during three successive typhoons.

The target for fish catches in 1957, the first year of the Second Four-Year Production Plan, has been set at 205,000 tons.

WHALING REVIVED: As part of the Sino-Japanese whaling enterprise, a shore station has been set up at Hengchun near the southern tip of the Taiwan Island. A Japanese catcher of 185 tons will arrive in the middle of February and start operations immediately. A shore station was in operation when the Japanese were in Taiwan, but it was abandoned during World War II.

--T. P. Chen, Fisheries Specialist, J.C.R.R., Taipei, Taiwan.

Union of South Africa

NOW AMONG FIRST TEN FISHING NATIONS: With a total catch of more than 570,000 metric tons in 1955, the Union of South Africa now ranks among the ten largest fishing nations of the world, according to a statement by South Africa's Director of Fisheries. More than 95 percent of the catch is made on South Africa's west coast, states a December 20, 1956, dispatch from the United States Consul in Cape Town.

The fishing fleet consists of 48 trawlers, 220 motor boats in the St. Helena area, and another 100 in the Walvis Bay area. There are 21 processing plants on the West Coast, many of which are equipped with reduction plants as well as canning lines. The plants have a capacity of 500 tons of raw fish an hour for canning, fish meal, and oil. A good part of the fish meal is exported; the remainder consumed in South Africa.

The spiny lobster caught by the South African fishermen is a very good source of dollar earnings, according to the Director. The United States is the best market for frozen spiny lobster tails.

U. S. S. R.

FREEZER SHIPS BUILT FOR PACIFIC FISHING GROUNDS: A number of refrigerated ships are being built in Russian shipyards for the Far East fishing grounds. The first of these, the Aktiubinsk, has recently been completed at the Leningrad shipyard. She is powered by four 1,800 hp. engines, and is fitted with a modern all-electric plant.

It is understood that the first series will comprise four ships, all to be based at Vladivostok, the December 1956 World Fishing reports.

United Kingdom

FIRM HAS LARGE FROZEN FISH ORDER FROM UNITED STATES: A United States order for quick-frozen fish worth $300,000 has been obtained by a British fish-processing firm in the face of competition from Iceland, Scandinavia, and the Continent.

The Chairman of the fish-processing firm states: "We have just opened the most modern fish-processing plant in the world at Hull to cope with a flood of overseas orders. We are already exporting to 64 countries and we believe this United States order marks a real achievement for the British Fishing Industry. The Americans have very high food standards and, in the case of the fish we export, every piece must be individually tested for quality. . . ."

The new fish plant owned by the firm cost £150,000 (US$420,000) to build and incorporates revolutionary features in its design and operation. The plant, employing 150 people, is fully automatic and tiled throughout. At the end of every day it is steam-sterilized from top to bottom. Production is now running at the rate of 35,000 pounds of quick-frozen fish fillets daily. The cold storage capacity is 500 tons.

"The demand for quick-frozen fish is increasing daily," said the Chairman. "This fish, which retains its natural sea-fresh taste, is especially popular in Australia, the Far East, and other countries where the supply of fresh fish is limited. What is more it helps to earn dollars and scarce foreign currency."

The new firm is fulfilling, as well as its export orders, contracts for the War Office, the U. S. Army, U. S. Air Force, the School Meals Services, and Hospitals (Fishing News, December 21, 1956).

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MINIMUM PORT PRICES INCREASED: The British Trawlers' Federation, composed of boat owners in Hull, Grimsby, and Fleetwood, increased their minimum landed fresh-fish prices about 58 U.S. cents a hundred pounds effective January 1, 1957. A spokesman for the Federation stated that "the decision to increase the minimum port prices follows greatly increased trawler operating costs since the last price adjustment in September 1954."

The new dockside prices will increase the minimum price on drawn haddock from about US$4.75 to $5.00, cod from US$4.75 to $5.30, and plaice from US$5.50 to $7.00 a 100 pounds (The Fishing News, November 30, 1956).

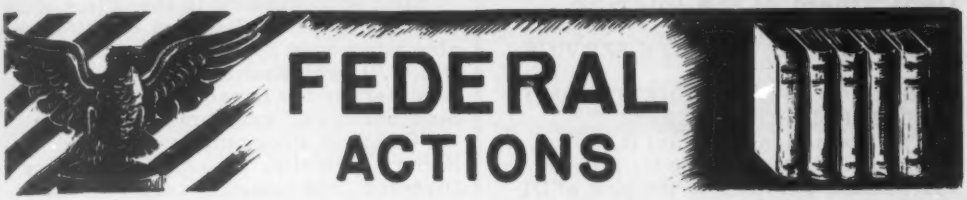
* * * * *

TRAINING COURSES FOR FISHERMEN: Training courses for new recruits to the fishing industry in the United Kingdom have been organized at Hull, Grimsby, Lowestoft, Plymouth, and in Scotland. Additional courses to enable those already in the industry to improve their positions have also been organized at Grimsby, Hull, Fleetwood, Lowestoft, Milford Haven, and in Scotland. The courses are under the direction of the local educational authorities with the federal White Fish Authority donating maintenance grants and allowances, reports the December 1956 Trade News of the Department of Fisheries of Canada.

* * * * *

TWO MORE FACTORY TRAWLERS OF "FAIRTRY" TYPE ON ORDER: The owners of the fish-factoryship Fairtry have placed an order with a British shipbuilding firm for two more fish-factory trawlers, each 235 feet in length and 47 feet in breadth.

Propulsion will be by Diesel engines and another firm has received an order for two 2,000 shaft horse power Diesel electric motors, one for each vessel. The horsepower is unusually high for Diesel electric equipment sets in that country, and is understood to be somewhat more powerful than that used in the factory-trawler Fairtry.



Committee for Reciprocity Information

CONSULTATIONS WITH COUNTRIES IMPOSING RESTRICTIONS ON IMPORTS FOR BALANCE-OF-PAYMENTS REASONS UNDER GATT:

The Committee for Reciprocity Information issued notice on February 12 that the views of interested parties are requested in connection with the forthcoming consultations with certain countries parties to the General Agreement on Tariffs and Trade (GATT) which maintain restrictions on imports for balance-of-payments reasons.

The consultations under Article XII of the Agreement (61 Stat. (pt. 5) A34) will afford an opportunity to review with each consulting country its financial situation and discuss the possibilities for further relaxation of the level of import restrictions and practices that have proved especially burdensome for United States exporters. These restrictions must be progressively relaxed as conditions improve and eliminated when conditions no longer justify their use.

The consultations will begin in Geneva in June with the following countries: Sweden, Denmark, Italy, The Netherlands, Norway, Greece, Austria, Germany, and France, and in October with these countries: Turkey, Finland, Brazil, Australia, Union of South Africa, Japan, United Kingdom, Rhodesia and Nyasaland, Ceylon, Pakistan, and New Zealand.

United States firms and organizations having an interest in the export trade may have pertinent information on the restrictions and their effects that will be useful to the United States Government in these consultations. The following types of information are sought:

1. Information indicating discrimination in the treatment of goods available from the United States as compared with the treatment afforded similar goods from other countries with convertible currencies;

2. Information indicating that trade is being restrained by complex or arbitrary licensing procedures or lack of adequate information available to traders regarding import regulations;

3. Information indicating that reasonable access to a traditional foreign market has not been restored for a particular commodity even though the country concerned has substantially relaxed its restrictions on imports in general;

4. Information indicating that the long-standing application of import restrictions by a country on a particular product has been accompanied by the growth of uneconomic output of that product within the country;

5. Information indicating that loss of foreign markets as a result of import restrictions has been responsible for a contraction of production or employment in an industry in the United States.

The Committee for Reciprocity Information is an interagency group within the United States Government which collects the views of interested persons regarding trade agreement matters. The Committee consists of representatives from the Departments of State, Treasury, Defense, Agriculture, Commerce, Labor, Interior, and the United States Tariff Commission.

Written statements were to be submitted no later than March 29, 1957, concerning those countries consulting in June and no later than July 31 for those consulting in October.

Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE APPOINTMENTS:

The promotion of Daniel H. Janzen, A Regional Director of the U. S. Fish and Wildlife Service, to the post of Director of the Service's new Bureau of Sport Fisheries and Wildlife, was announced on February 8 by Secretary of the Interior Fred A. Seaton.

Janzen will replace John L. Farley, Acting Director, whose resignation was accepted by Secretary Seaton. Janzen began his new duties immediately. Secretary Seaton said an announcement will be made shortly on the appointment of a director for the separate Bureau of Commercial Fisheries. Both Bureau Chiefs will act under the direction of Ross L. Leffler, recently named as Assistant Secretary for Fish and Wildlife.

Janzen has been with the Federal Government since 1929, when he joined the staff of the United States Bureau of Biological Survey. When the Biological Survey and the Bureau of Fisheries were consolidated in 1940 to form the Fish and Wildlife Service, Janzen continued with the Service. He became Assistant Regional Director of Region 3 in 1940 and in July of 1946 he was named head of that Region. Headquarters for Region 3 are in Minneapolis, Minn.

"Career personel are being selected to head this new organization and will be relied upon to carry out the dynamic new national fish and wildlife conservation program which is now being developed," Secretary Seaton said, "to meet the future's challenging needs."

The promotion of additional career employees to key posts in the Bureau of Sport Fisheries and Wildlife was announced February 12, by Assistant Secretary for Fish and Wildlife, Ross L. Leffler of the Department of the Interior.

Abram V. Tunison, Chief of the Branch of Game-Fish and Hatcheries, was named Assistant Director for Fisheries, and Lansing A. Parker, Assistant Chief of the Branch of Federal Aid, Assistant Director for Wildlife.

Staff appointments in the Office of the Commissioner of Fish and Wildlife were also announced by Secretary Leffler. Dr. O. Lloyd Meehean, who has been Assistant to the Director, Technical Staff Services, was named Director of the Office of Program Review, and Robert A. Wells, also Assistant to the Director, was named Director of the Office of Information.

All of these appointments are effective on March 1.

From 1932 to 1944, Tunison was employed by the New York State Conservation Department as a junior aquatic biologist at Cortland, N. Y., conducting research into trout nutrition and "in-service" training for fish culturists and hatchery superintendents. He transferred to the employ of the U. S. Fish and Wildlife Service in 1944 as a fish management technician at the same station which is cooperatively operated by the Service, New York, and Cornell. On December 3, 1945, he was promoted to Assistant Chief of the Branch of Game-Fish and Hatcheries and transferred to the central office. He was promoted to Chief of the Branch in 1954.

Parker from 1940 to 1943 was with the Minnesota Division of Fish and Game, first directing game research and then coordinating the Federal Aid program. He was with the Rubber Development Corporation of the R. F. C. in Brazil during 1943-1944 and then after six more months with the Minnesota Division of Fish and Game, handling the Federal Aid program, he joined the Fish and Wildlife Service staff as a land acquisition and development specialist in the Federal Aid Branch. He was promoted to Assistant Chief of the Branch in 1948.

Meehean joined the staff of the old Bureau of Fisheries as a biologist in 1930. Stationed mostly in southern States, he conducted research into pondfish propagation, lake management, and ecology of waters until he was transferred to the central office, then in Chicago, as Assistant Chief of the Division of Fish Culture, later the Branch of Game-Fish and Hatcheries, of which he became Chief in 1945. In 1954, he was promoted to the position of Assistant to the Director, Technical Staff Services.

Wells, a newspaperman and conservation columnist with the Watertown (New York) Times, joined the staff of the State of New York Conservation Department, of which he was Secretary from 1946 to 1955. For more than 20 years active in conservation in New York, he was one of the organizers of the Northeastern Waterfowl Association and the Joint Waterfowl Committee of the Atlantic Flyway. He was formerly vice chairman of the National Waterfowl Council. He joined the staff of the Fish and Wildlife Service as an Assistant to the Director in 1955.

Department of the Treasury

BUREAU OF CUSTOMS

CUSTOMS INSTRUCTED TO APPRAISE ENTRIES OF FROZEN TUNA:

The Treasury Department has instructed Bureau of Customs field officers to appraise entries of Japanese frozen tuna without regard to any question of dumping, according to a March 1 news release from that Agency. These instructions were issued after a determination under the Antidumping Act that sales of tuna in the United States had not been made and were not likely to be made at less than fair value.

Early in December the Treasury Department had instructed Customs field officers to withhold appraisement of entries of frozen whole albacore tuna from Japan pending investigation to determine whether the tuna was being sold in the United States at less than fair value.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JANUARY 1957, P. 88.

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GROUNDFISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1957:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets and steaks for calendar year 1957 is 37,375,636 pounds, the Bureau of Customs announced in the February 16 Federal Register. Divided into quarterly quotas this means that 9,343,909 pounds of groundfish fillets during each quarter may be imported at the $1\frac{7}{8}$ cents-per-pound rate of duty, and any imports over the quarterly quota will be dutiable at the rate of $2\frac{1}{2}$ cents a pound.

Table 1 - Reduced-Tariff-Rate Import Quota for Fresh and Frozen Groundfish Fillets and Steaks, 1951-57

1957	1956	1955	1954	1953	1952	1951
(Million Pounds)						
37.4	35.2	35.4	34.0	33.9	31.5	29.3

The reduced-rate import quota for 1957 is 6.2 percent higher than the 1956 quota of 35,196,575 pounds. From 1951 to 1957, the quantity of fresh and frozen groundfish fillets permitted to enter the United States at the reduced rate of duty of $1\frac{7}{8}$ cents a pound has increased 27.6 percent.

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks) for the three years (1954-1956) preceding 1957 was 249,170,904 pounds, calculated in accordance with the proviso to item 717 (b) of Part I, Schedule XX, of

Table 2 - United States Aggregate Apparent Annual Consumption of Fresh and Frozen Groundfish Fillets and Steaks

3-Year Period	Quantity
	(Million Lbs.)
1954-56	249.2
1953-55	234.6
1952-54	236.2
1951-53	226.3

the General Agreement on Tariffs and Trade (T. D. 51802). The proviso states that the import quota for any current calendar year shall be 15,000,000 pounds or 15 percent of the average aggregate apparent consumption in the three years preceding the current year, whichever is greater. The tariff item in summarized form is: "Fish, fresh, or frozen (whether or not packed in ice), filleted, skinned, boned, sliced, or divided into portions, not specially provided for: Cod, haddock, pollock, cusk, and rosefish (ocean perch)." Fillet blocks and slabs for making fish sticks are also included under this category.

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks for the three-year period of 1953-55 was 234,643,830 pounds, substantially less than the average annual consumption of 249,170,904 pounds for the three-year period of 1954-56.

* * * * *

UNITED STATES CANNED IN BRINE TUNA IMPORTS IN 1957 UNDER QUOTA PROVISO:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1957 at the 12½-percent rate of duty is limited to 45,460,000 pounds. Any imports in excess of that quantity will be dutiable at 25 percent ad valorem. The quota is based on preliminary data and is subject to possible change on the basis of complete data.

Any tuna classifiable under Tariff Act paragraph 718 (b)--"fish, prepared or preserved in any manner, when packed in airtight containers. . .(except fish packed in oil or in oil or other substances; . . . .)--which is entered or withdrawn, for consumption during 1957 is included.

A proclamation (No. 3128), issued by the President on March 16, 1956, gave effect to an exchange of notes with the Government of Iceland to withdraw tuna canned in brine from the 1943 trade agreement and invoked the right to increase the duty reserved by the United States in negotiations with Japan and other countries under the General Agreement on Tariffs and Trade. The quota is based on 20 percent of the previous year's United States pack of canned tuna.

The notice as published in the February 8, 1957, Federal Register follows:

DEPARTMENT OF THE TREASURY

Bureau of Customs

[T. D. 54299]

TUNA FISH

TARIFF RATE QUOTA

FEBRUARY 4, 1957.

Pursuant to the President's Proclamation No. 3128 of March 16, 1956 (T. D. 54051), it has been determined that 45,460,000 pounds of tuna may be entered for consumption or withdrawn from warehouse for consumption during the calendar year 1957 at the rate of 12½ per centum ad valorem under paragraph 718 (b), Tariff Act of 1930, as modified. Any tuna classifiable under paragraph 718 (b) of the tariff act which is entered, or withdrawn, for consumption during the current calendar year in excess of this quota will be dutiable at the full rate of 25 per centum ad valorem.

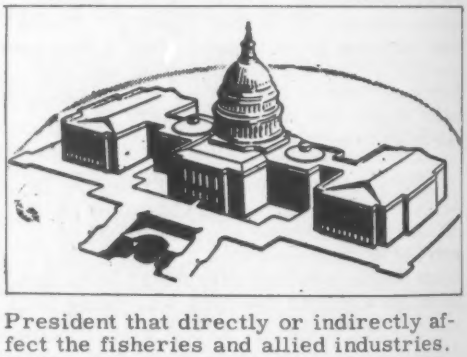
The above quota is based on the indicated United States pack of canned tuna for the calendar year 1956 as reported by the United States Fish and Wildlife Service on the basis of preliminary data assembled by that Service. It is subject to possible change on the basis of complete data.

[SEAL] RALPH KELLY,
Commissioner of Customs.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, MAY 1956, P. 67.

Eighty-Fifth Congress (First Session)

Listed below are public bills and resolutions introduced and referred to committees or passed by the Eighty-Fifth Congress (First Session) and signed by the



President that directly or indirectly affect the fisheries and allied industries. Public bills and resolutions are shown in this section when introduced and, if passed, when signed by the President; but also shown from month to month are the more pertinent reports, hearings, or chamber actions on some bills.

AID FOR DEPRESSED AREAS: S. 1433 (Martin and others) introduced in the Senate February 28, a bill to assist areas to develop and maintain stable and diversified economics by a program of financial and technical assistance and otherwise, and for other purposes; to the Senate Committee on Banking and Currency. This bill to be known as the "Administration's Area Assistance Act of 1957" provides for assistance to localities within states where there are more workers than there

is work, and in places where there is need of Industry. Also H. R. 5459 (Carrigg) and H. R. 5500 (Van Zandt) introduced in the House February 28 and similar to S. 1433 (Martin and others); referred to the House Committee on Banking and Currency.

ANTIDUMPING ACT OF 1921: H. R. 5120 (Forand), H. R. 5138 (Mack of Washington), and H. R. 5139 (Mason) introduced in the House February 20, bills to amend the Antidumping Act of 1921, and for other purposes; to the Committee on Ways and Means. This bill provides for amendments to various sections of the Antidumping Act of 1921, among which are: a "special dumping duty" if the purchase price or the exporter's sale price is less than the foreign market value; spells out methods of determining "purchase price," "exporter's sales price," "foreign market value," and "cost of production."

FISHING VESSEL RIGHTS ON THE HIGH SEAS: H. R. 5526 (Bonner) introduced in the House on March 4, a bill to amend the Act of August 24, 1954 (68 Stat. 883), relating to the rights of vessels of the United States on the high seas and in the territorial waters of foreign countries; referred to the Committee on Interstate and Foreign Commerce. This bill proposes to amend the Fishermen's Protective Act, which provides that the U. S. Government shall reimburse vessel owners for any fine paid in order to secure the prompt release of a vessel and its crew seized by a foreign country on the basis of rights or claims in territorial waters or the high seas which are not recognized by the United States. This bill would amend the Act so as to extend the obligation of the Government to reimburse the owners, not only for fines paid, but for all expenses incurred by reason of seizure, where the seizure took place beyond the limits recognized by the United States. Claims for injuries arising from such seizures shall be paid and upon the death of a seaman the Secretary of the Treasury shall pay $10,000 to dependents. Also S. 1483 (Magnuson) introduced in the Senate March 5; referred to Committee on Interstate and Foreign Commerce.

IMPORT AGREEMENTS: H. R. 5666 (Hemphill) introduced in the House on March 6, a bill to require that all agreements and understandings respecting the importation of foreign goods, entered into with foreign countries or their citizens, shall be reduced to writing and made public; to the Committee on Ways and Means. Provides that from and after the date of the enactment of this Act, every import agreement entered into by a department, agency, or independent establishment of the United States shall be reduced to writing, signed by a responsible office or officers of the department, agency, or establishment and by a responsible office or officers of the government of the foreign country involved and any other citizen or resident directly concerned with importation to the United States of the goods covered by the agreement, and published in the Federal Register. The bill is designed to prevent any officers or agencies of the United States from entering into informal unwritten agreements and understandings with foreign countries.

IMPORT QUOTAS: H. R. 5691 (Whitener) introduced in the House on March 6, a bill to regulate the foreign commerce of the United States by establishing import quotas under specified conditions, and for other purposes. Similar to seven or more other bills previously introduced (see Commercial Fisheries Review, February 1957 p. 64). Also referred to the Committee on Ways and Means.

INCREASED COVERAGE UNDER FAIR LABOR STANDARDS ACT: H. R. 5389 (Lane) and H. R. 5394 (Powell) introduced in the House February 27, bills to amend the Fair Labor Standards Act of 1937, as amended, to provide coverage for employees of employers who are engaged in activities affecting interstate commerce, to eliminate certain exemptions, and for other purposes. Also H. R. 5770 (Rodino), H. R. 5773 (Staggers) introduced in the House March 7., and similar to H. R. 5389 (Lane) plus 8 or more other bills previously announced (see Commercial Fisheries Review, February 1957, p. 64). All referred to the Committee on Education and Labor. Various bills have been introduced this session to increase the minimum wage, broaden coverage, and eliminate existing exemptions in the Fair Labor Standards Act.

INTERIOR DEPARTMENT APPROPRIATIONS: H. R. 5189 (Kirwan) introduced in the House February 21, a bill making appropriations for the Department of the Interior and related agencies (including the United States Fish and Wildlife Service) for the fiscal year ending June 30, 1958, and for other purposes; to the Committee on Appropriations.

Committee on Appropriations reported the bill to the House on February 21 (Rept. No. 145), and referred it to the Committee of the Whole House on the State of the Union.

Passed the House without further amendments on February 26. The bill provides the Bureau of Commercial Fisheries with $6,000,000 for Management and Investigation of Resources in fiscal year 1958, an increase of $1,328,800 over the amount appropriated for fiscal year 1957. The additional funds include (1) $379,375 to offset the 12½ percent of the receipts from the sale of Pribilof Island sealskins allotted to the Bureau of Sport Fisheries and Wildlife (original budget estimates had allotted the entire 25 percent to the Bureau of Commercial Fisheries); (2) $350,000 to initiate education and training grants authorized by the Act of August 8, 1956 (Public Law No. 1027)--this was less than the $583,000 proposed in the budget. Additional increases provide $182,500 for retirement costs, and $416,925 primarily for research on fish migrations over dams and administration of Alaska fisheries. Funds for construction ($700,000) provide $400,000 for construction of a fishery research laboratory at Juneau, Alaska, and $300,000 for the fishery technology laboratory at Gloucester, Mass. The Fisheries Loan Fund was allowed an administrative expense limitation of $313,000 as recommended in the budget. This is an increase of $63,000 over the limitation for the fiscal year 1957.

The bill recommends $12,000,000 for management and investigation of resources in the Bureau of Sport Fisheries and Wildlife. This is $380,000 less than requested in budget estimates and will be compensated for by making available 12½ percent of the receipts from Alaska sealskins. The appro-

priation as approved, provides for an increase of $479,200 for retirement costs and $713,400 for operation and maintenance of the fish culture facilities, fishery and wildlife research, soil and moisture conservation, and river basin studies. The budget construction estimate of $5,332,000 was allowed for construction of fish hatchery, game management, and wildlife refuge facilities. This is an increase of $2,731,000 over the appropriation for fiscal year 1957.

Under the appropriation for the Fish and Wildlife Service as distinguished from the separate Bureau, all funds for administration expenses were denied. Funds for "General Administration" will be provided after further study and review to determine the minimum overhead staffing required to assume efficient operation. However, $94,000 is provided under the "Salaries and Expenses" item for the Office of the Secretary of Interior to establish the Office of the Assistant Secretary for Fisheries and Wildlife.

House Report No. 145, Department of the Interior and Related Agencies Appropriation Bill, 1958 (February 21, 1957, 85th Congress, 1st Session) to accompany H. R. 5189, 30 pp., printed. Summarizes the bill and gives details on actions by the Committee agency by agency; presents a comparative statement of the approriations for 1957 and estimates for 1958.

INVESTIGATION OF FISH IMPORTS: H. Res. 164 (Mack) introduced in the House February 11, a resolution requesting an investigation of imports; referred to the Committee on Ways and Means. The Resolution directs the United States Tariff Commission pursuant to section 332 of the Tariff Act of 1930, as amended, to make a thorough investigation of the domestic crab meat, oyster, salmon, tuna, and other fishery products industry, including the effect of imports of fisheries products on the livelihood of American workers, and to report the results to the Committee on Ways and Means.

Such investigation shall be made after due notice and opportunity for hearing is given all interested parties. The report of the Commission shall set forth the facts so determined relative to production, trade, imports, and consumption in the United States and shall take into account all revelant factors affecting the domestic economy, including the interests of consumers, processors, and producers, and a comparison of wage rates in the United States and abroad, costs of transportation to the principal consuming centers, and other factors bearing on cost of production and distribution. Such report shall contain a statement of findings as to the effect upon the competitive position of the domestic fisheries industry of the present tariff status of imported crab meat, oysters, salmon, tuna, and other fisheries products, so as to assist the Congress in determining what changes, if any, should be made in such tariff status, based upon the principle of fair and reasonable competition. Also H. Res. 180 (Scudder) introduced February 27, similar to H. Res. 164 (Mack).

LOANS TO NONPROFIT ORGANIZATIONS: H. R. 5693 (Coffin) introduced in the House on March 6, a bill to amend the Small Business Act of 1953 to authorize the Small Business Administration to make loans to local private nonprofit organizations formed to assist, develop, and expand the economy of the area; to the Committee on Banking and Currency. The bill empowers the Small Business Administration to make loans (either directly or in cooperation with banks or other leading institutions through agreements to participate on an immediate or deferred basis) to local private nonprofit organizations (including industrial foundations, development credit corporations or similar groups) formed to assist, develop, and expand the economy of the area. Limits loans to 20 years or less.

SMALL BUSINESS: Senate Report No. 12, Increased Loan Authority for Small Business Administration (January 25, 1957, 85th Congress, 1st Session) to accompany S. 637, 3 pp., printed. Discusses the purpose, justification, changes in existing law, and the Small Business Act of 1953 in conjunction with S. 637, a bill to increase the business loan authorization of the Small Business Administration.

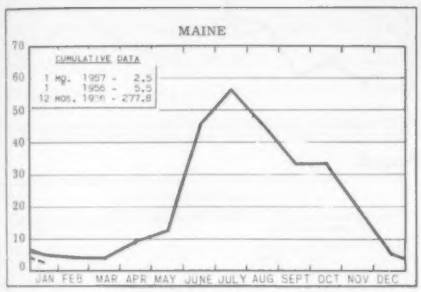
Senate Report No. 46, Seventh Annual Report of the Select Committee on Small Business (February 1, 1957, 85th Congress, 1st Session), 156 pp., printed. Among other subjects, discusses the Small Business Administration and financial problems of small business.

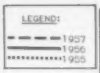
TARIFFS AND QUOTAS URGED BY THE STATE OF MASSACHUSETTS: The General Court of Massachusetts has forwarded to Congress a memorial urging increased tariffs and quotas on imported fishery products and textiles. The memorial (Martin) was referred to the Committee on Ways and Means.

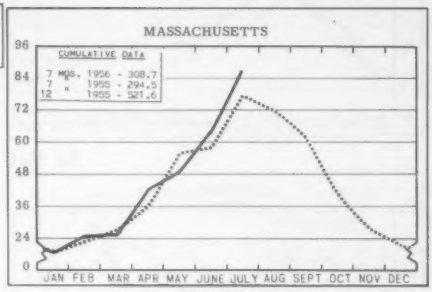
TRADE AGREEMENTS: House Document No. 93, First Annual Report on the Operation of the Trade Agreements Program (February 11, 1957, 85th Congress, 1st. Session), message from the President of the United States, 252 pp., printed. Discusses the gains made under the Trade Agreements Program; tariff negotiations to remove barriers to trade and adjustments in existing concessions; reducing and removing quantitative barriers to trade; special legislative provisions: "Escape Clause" and "National Security," and development under bilateral agreements. A number of appendixes contain the various reports to the Secretary of State by the Chairman of the various United States delegations to the various sessions held at Geneva (Eighth Session, September 17 to October 24, 1953; Ninth Session, October 28, 1954-March 7, 1955; Tenth Session, October 27 to December 3, 1955; Eleventh Session, October 11 to November 17, 1956) of the Contracting Parties to the General Agreement on Tariffs and Trade.

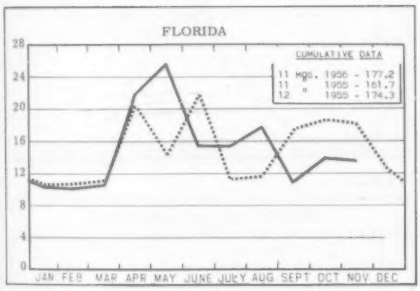
CHART 1 - FISHERY LANDINGS for SELECTED STATES

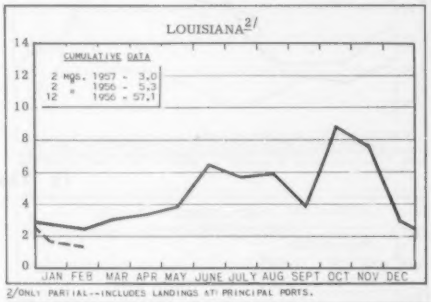
In Millions of Pounds



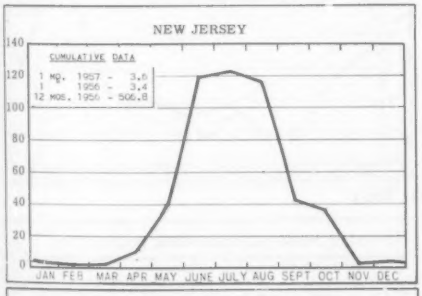


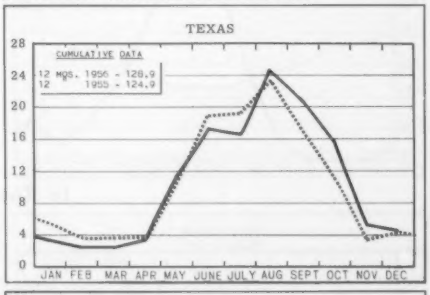


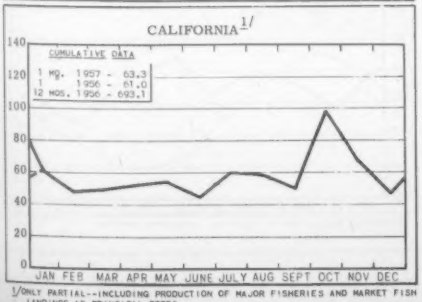




2/ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.







1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

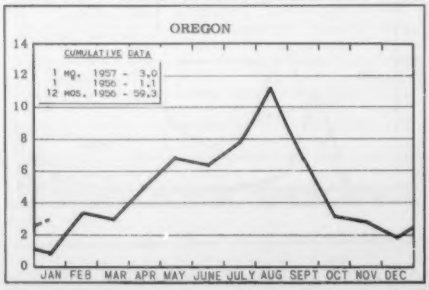
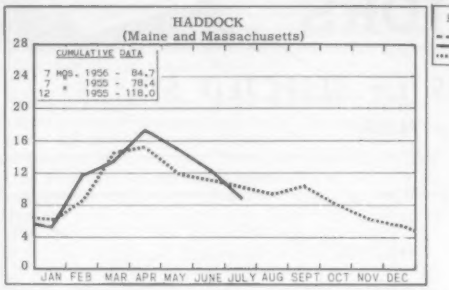
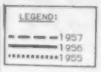
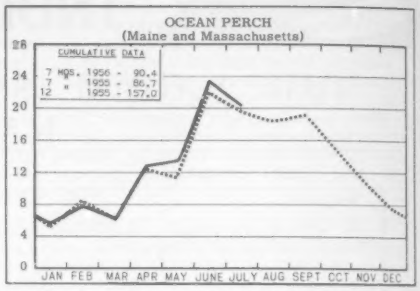


CHART 2 - LANDINGS for SELECTED FISHERIES

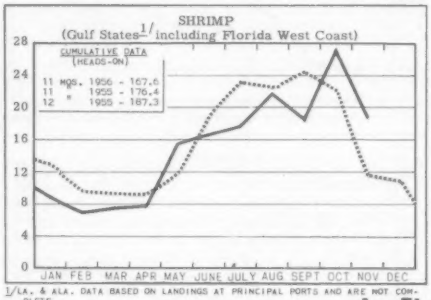
In Millions of Pounds



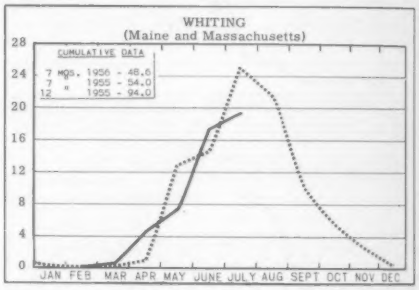




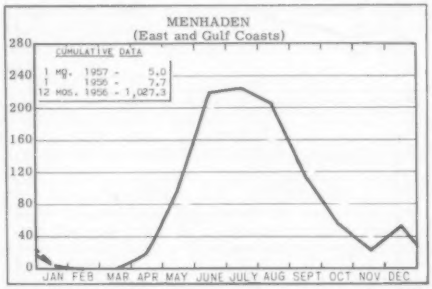
In Millions of Pounds

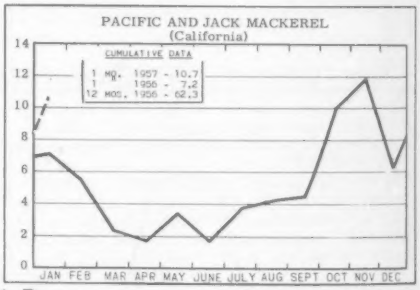


1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

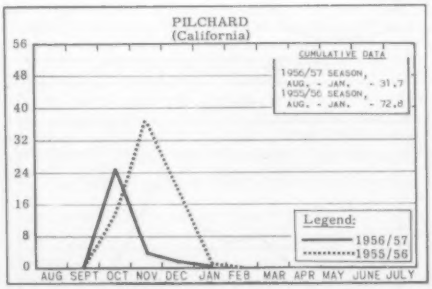


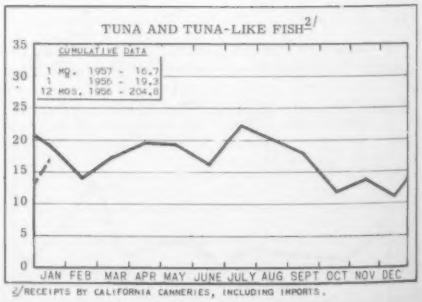
In Thousands of Tons





In Thousands of Tons

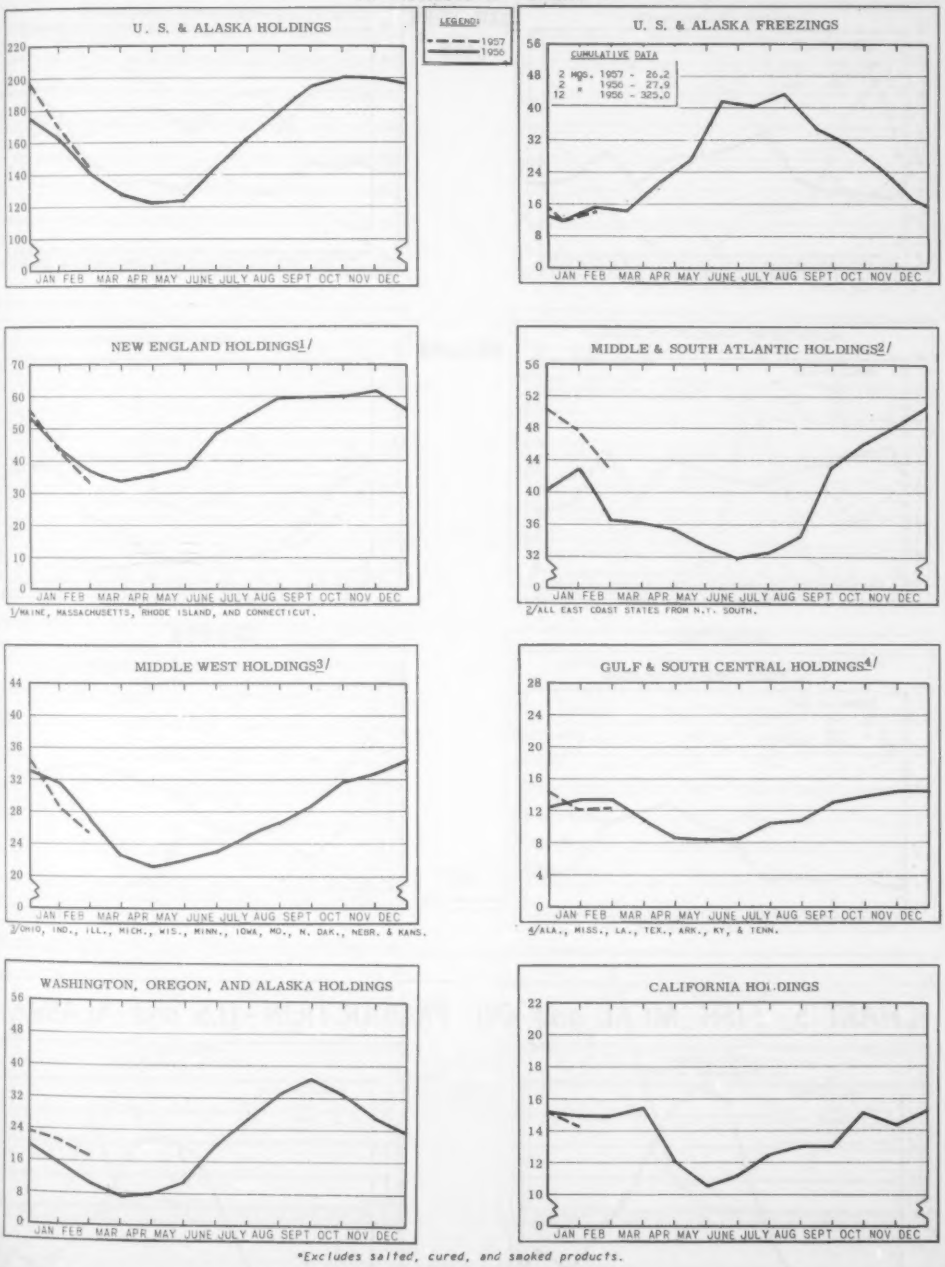




2/RECEIPTS BY CALIFORNIA CANNERIES, INCLUDING IMPORTS.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds



1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.

2/ALL EAST COAST STATES FROM N.Y. SOUTH.

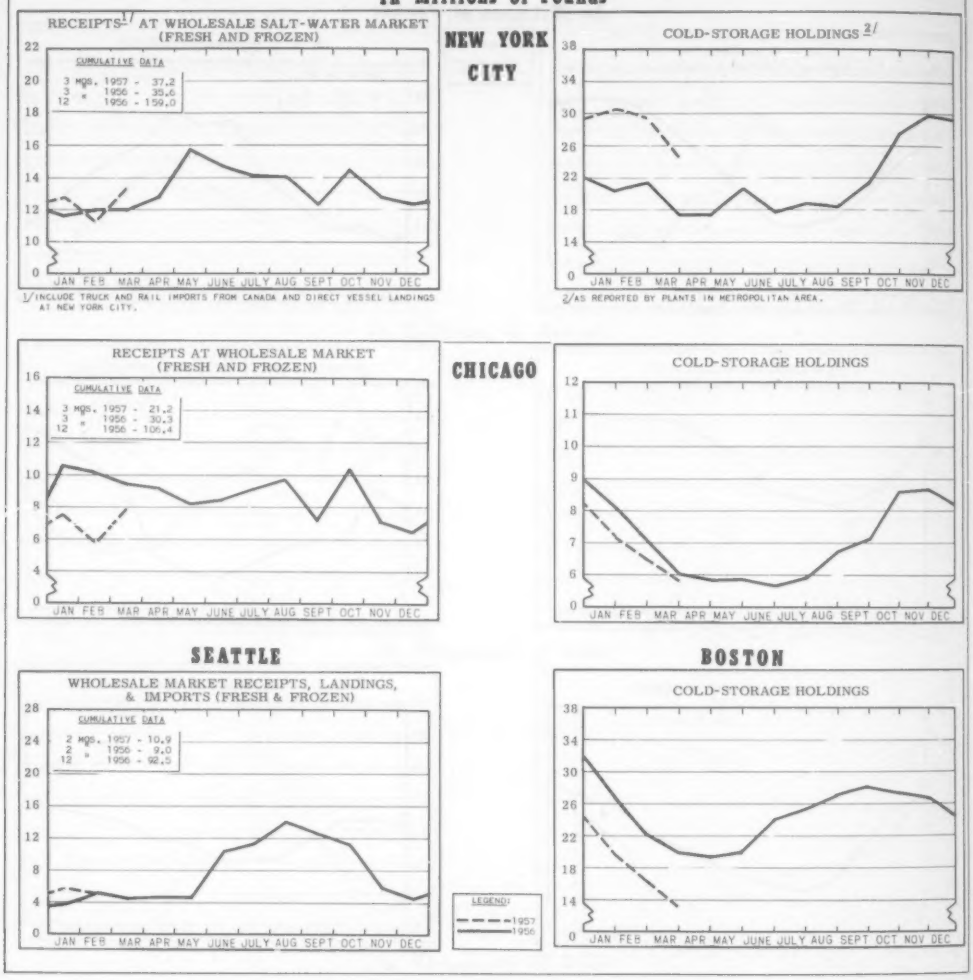
3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY, & TENN.

*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds



1/ INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

2/ AS REPORTED BY PLANTS IN METROPOLITAN AREA.

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

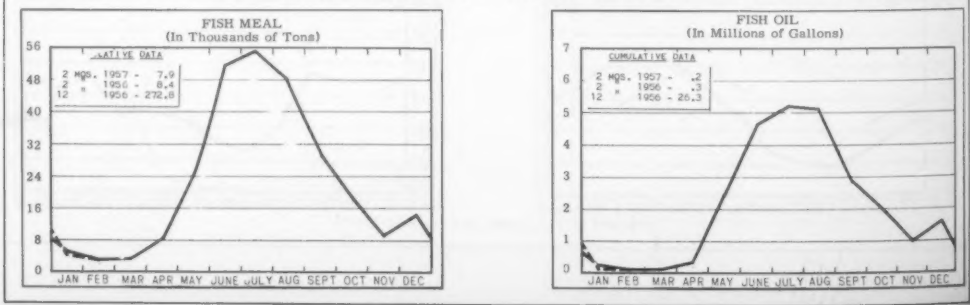
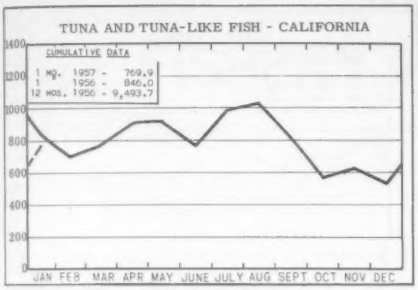
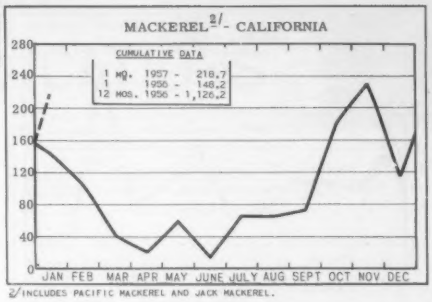


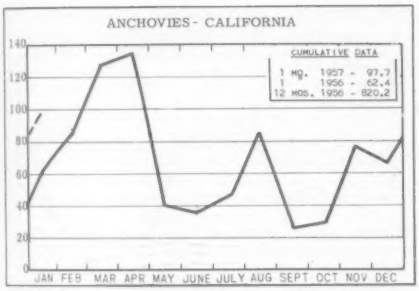
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

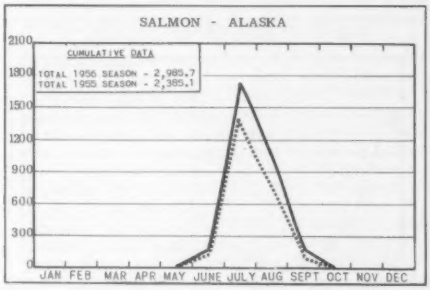
In Thousands of Standard Cases

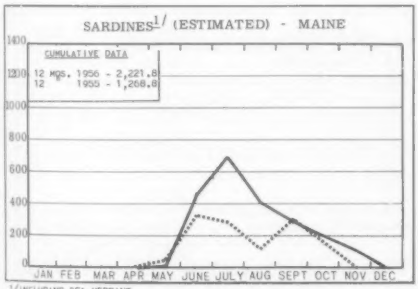




2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



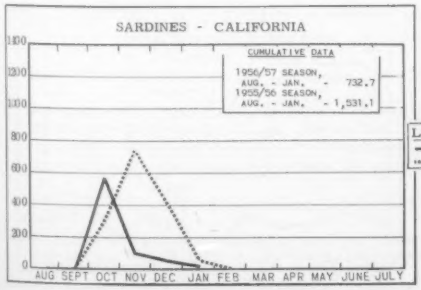


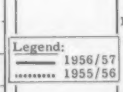


1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA	48	No. ½ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	½ lb.	8 oz.





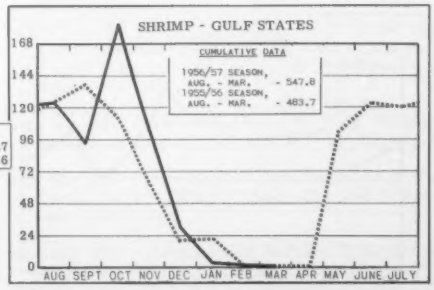
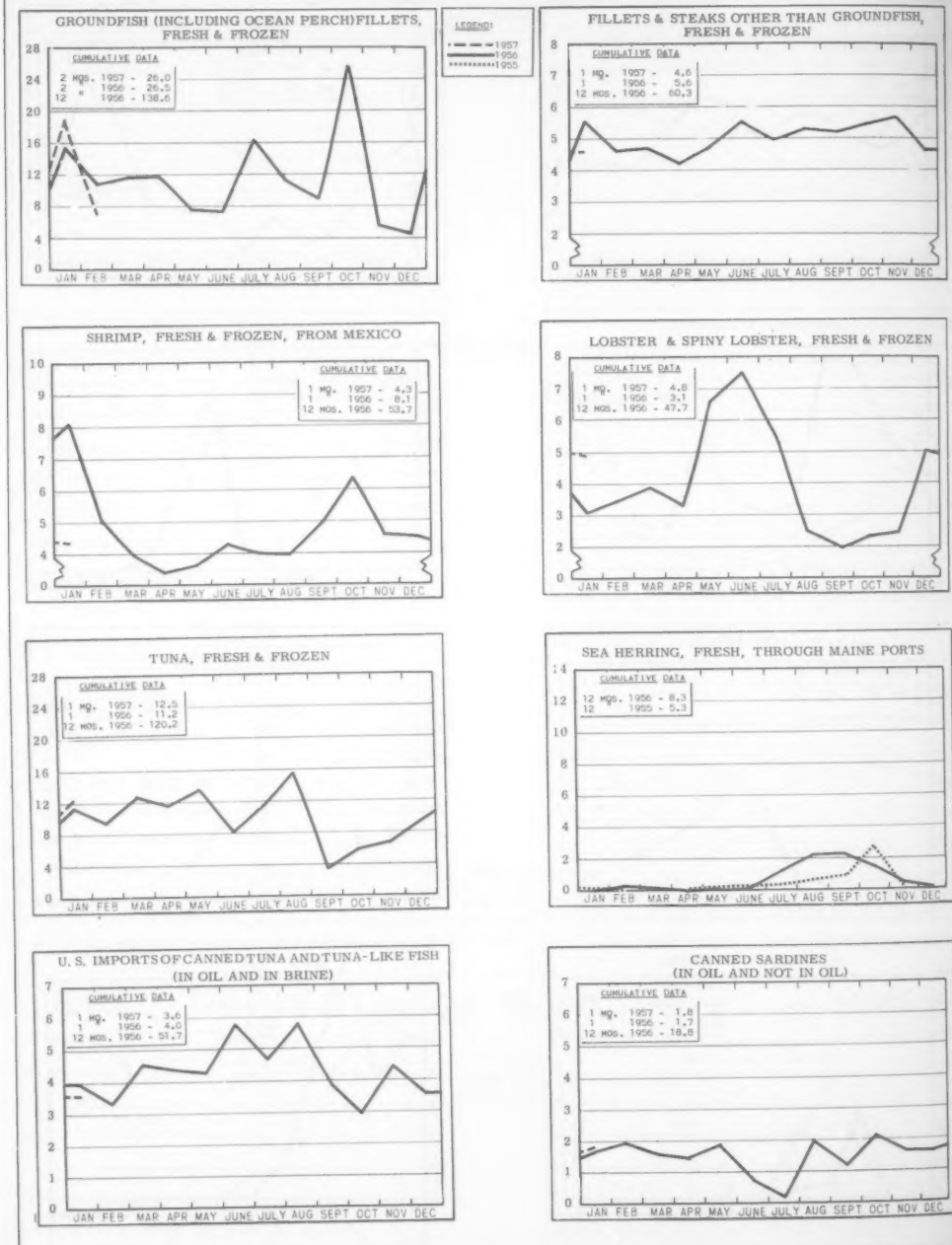
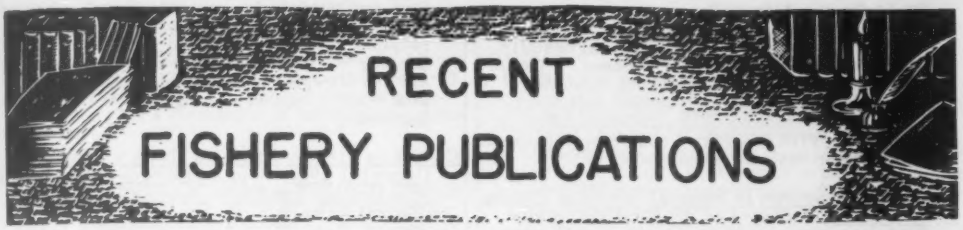


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
SSR.- FISH.- SPECIAL SCIENTIFIC REPORTS - FISHERIES (LIMITED DISTRIBUTION).
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1460 - Florida Landings, October 1956, 6 pp.
CFS-1461 - Mississippi Landings, September 1956, 2 pp.
CFS-1463 - Mississippi Landings, October 1956, 2 pp.
CFS-1464 - Georgia Landings, November 1956, 2 pp.
CFS-1465 - Fish Meal and Oil, November 1956, 2 pp.
CFS-1466 - Texas Landings, November 1956, 3 pp.
CFS-1467 - Frozen Fish Report, December 1956, 8 pp.
CFS-1468 - New Jersey Landings, November 1956, 4 pp.
CFS-1469 - Rhode Island Landings, September 1956, 3 pp.
CFS-1470 - Fish Stick Report, 1956 Annual Summary, 2 pp.
CFS-1471 - California Landings, September 1956, 4 pp.
CFS-1472 - Alabama Landings, October 1956, 2 pp.
CFS-1473 - New York Landings, November 1956, 4 pp.
CFS-1474 - Maine Landings, November 1956, 3 pp.
CFS-1475 - Mississippi Landings, November 1956, 2 pp.
CFS-1476 - Rhode Island Landings, October 1956, 4 pp.
CFS-1477 - Ohio Landings, December 1956, 2 pp.
CFS-1478 - Texas Landings, December 1956, 3 pp.
CFS-1479 - Fish Meal and Oil, December 1956, 2 pp.
CFS-1480 - New England Fisheries, 1955 Annual Summary, 7 pp.
CFS-1481 - North Carolina Landings, December 1956, 2 pp.
CFS-1482 - Georgia Landings, December 1956, 2 pp.
CFS-1483 - Florida Landings, November 1956, 6 pp.
CFS-1484 - Alabama Landings, November 1956, 2 pp.
CFS-1485 - Rhode Island Landings, November 1956, 2 pp.
CFS-1486 - New Jersey Landings, December 1956, 4 pp.
CFS-1488 - Shrimp Landings, October 1956, 4 pp.
CFS-1490 - Rhode Island Landings, December 1956, 3 pp.
CFS-1491 - Maine Landings, December 1956, 4 pp.
CFS-1492 - North Carolina Landings, 1956 Annual Summary, 5 pp.

SSR-Fish. No. 187 - Commercial and Sport Shad Fisheries of the Edisto River, South Carolina, 1955, by Charles H. Walburg, 13 pp., illus., processed, October 1956. Gives results of an investigation of the shad fishery of the Edisto River, South Carolina, to determine fishing effort, fishing rate, total catch, size of run, and spawning escapement for 1955. The commercial fishery catch-and-effort data were obtained from logbooks kept by each fisherman. The total catch made by sport fishing was determined by a post-card survey. The catch-and-effort data were combined with a tagging and recovery program, and it was estimated that the fishing rate was approximately 20 percent, the total catch was 11,000 shad, and the size of the run was 56,000 shad (fiducial limits 28,000 to 100,000). Unfortunately, catch-and-effort records for previous years were not available for this stream; therefore, sizes of former runs and escapements could not be determined.

SSR-Fish. No. 193 - Underwater Television Vehicle for Use in Fisheries Research, by R. F. Sand and R. L. McNeely, 19 pp., illus., processed, December 1956. Describes the prototype underwater television vehicle, and reviews its demonstrated utility as a practical research tool in fisheries and related marine investigations. Contains a general description of the underwater television vehicle which was designed by the authors. Construction details of the two sealed pressure vessels are given. The upper double chamber housed the vertical and horizontal control mechanism, and the lower cylindrical chamber housed the television camera. Also describes the control construction, television equipment, power supply, and use of the vehicle in undersea research.

SSR-Fish. No. 195 - Stream Surveys of the Sheepscot and Ducktrap River Systems in Maine, by Floyd G. Bryant, 23 pp., illus., processed, December 1956.

Sep. No. 468 - Some Factors Affecting "Sawdust" Losses During the Cutting of Fish Sticks.

Sep. No. 469 - Iron Sulfide Discoloration of Tuna Cans, No. 4 - Effect of Salt, Oil, and Miscellaneous Additives.

Sep. No. 470 - Research in Service Laboratories (February 1957): Contains these articles--

"Cold-Storage Life of Frozen Fish Improved by Better Handling Practices," "Identification of Tuna Pigments," "Revised Federal Specifications for Breaded Shrimp Proposed," "Use of X-Ray Fluoroscopy for Fish Bone Detection Show Promise."

Sep. No. 471 - Fish Hatchery Food from Anchovies Caught Near Santa Barbara, Calif.

Technical Supplement to National Survey of Fishing and Hunting (A Report on the First Nationwide Economic Survey of Sport Fishing and Hunting in the United States during the Calendar Year 1955), Circular 44-Supp., 98 pp., processed. This supplement contains detailed information on the sampling plan and other survey techniques used by the firm of Crossley, S-D Surveys, Inc., in conducting the fishing and hunting survey under contract with the Fish and Wildlife Service. It discusses the technique of the survey; the sample (condensed description); sample design for national study of hunting and fishing; general instructions; sampling procedure; and contains samples of questionnaires, memory aids, and other materials used in the survey.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Life History of Lake Herring of Green Bay, Lake Michigan, by Stanford H. Smith, Fishery Bulletin 109 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 57, pp. 87-138), 55 pp., illus., printed, 35 cents, 1956.

Shrimp Tips from New Orleans, Circular No. 41, 17 pp., illus. in color, printed, 15 cents. A beautifully-illustrated shrimp recipe book in color with 18 different ways of preparing shrimp. Ingredients of all of the recipes such as those for Shrimp Amandine, Remoulade, Creole of Jambalaya, are available at any market and are usually already in the home kitchen.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Boston Fishery Products Monthly Summary, December 1956, 15 pp.; Boston Fishery Products Monthly Summary, January 1957, 15 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Landings and ex-vessel prices by species for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; and Boston frozen fishery products prices to primary wholesalers; for the months indicated.

Gulf Monthly Landings, Production and Shipments of Fishery Products, January 1957, 5 pp. (Market News Service, U.S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; and wholesale prices of fish and shellfish on the New Orleans French Market; for the month indicated.

(Seattle) Monthly Summary - Fishery Products, January 1957, 6 pp. (Market News Service, U.S. Fish and Wildlife Service, 421 Bell St. Terminal, Seattle 1, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Oregon) wholesale dealers; also Northwest Pacific halibut landings; for the month indicated.

California Fishery Products Monthly Summary, December 1956, 10 pp.; California Fishery Products Monthly Summary, January 1957, 10 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tuna-like fish, herring, mackerel, anchovies, and squid; pack of canned tuna, mackerel, herring, anchovies, and squid; market fish receipts at San Pedro, Santa Monica, San Diego, and Eureka areas; California imports; canned fish and frozen shrimp prices; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, January 1957, 4 pp.; Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, February 1957, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Fishery production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Ocean City, and Cambridge; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the months indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:

1955 Annual Report, Report No. 7, 152 pp., illus., printed. Alaska Department of Fisheries, 229 Alaska Office Bldg., Juneau, Alaska. Summarizes the activities of the Alaska Fisheries Board and the Alaska Department of Fisheries for 1955. The statistical tables cover the preceding 10-year period while the financial statement covers the fiscal year from April 1, 1955, to March 31, 1956. The 1955 research program of the Division of Biological Research was divided into three main projects. Research on the early life history of red salmon was carried out at Kitoi Bay. Taku River studies on the population dynamics of king salmon and catch and escapement indices of red, pink, chum, and silver salmon were continued. The study of the king crab at Kodiak was also continued. Also describes the inspection, predator control, sport fish, and watershed management programs. The statistical part of the report contains data on the value of the canned salmon by species, 1946-55; number of canneries and the salmon pack, 1946-55; salmon catch by gear, species, and districts, 1955; quantity and value of Alaska fisheries

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landings, 1946-55; and quantity and value of Alaska fisheries products prepared for market, 1946-55. In addition to a financial statement, the report concludes with a discussion of future plans of the Department.

BAIT FISH AND FISHING:

Contribution to the Problems of Bait Fish Capture and Mortality Together with Experiments in the Use of Tilapia as Live Bait, by Vernon E. Brock and Michio Takata, Industrial Advisory Council Grant No. 49, Final Report, 39 pp., illus., processed. Division of Fish and Game, Board of Agriculture and Forestry, Honolulu, Hawaii, January 1955.

BRAZIL:

Estatistica Brasileira da Pesca, 1950/1954 (Brazilian Fishery Statistics) 23 pp. tables, processed in Portuguese. Ministerio de Agriculture, Servicio de Estatistica da Producao, Rio de Janeiro, Brazil.

BYPRODUCTS:

"Condensed Fish Solubles in Turkey Rations," by R. D. Carter and J. W. Wyne, article, Feedstuffs, vol. 29, no. 2, January 12, 1957, pp. 10-11, printed, single copy 20 cents. Feedstuffs, Box 67, Minneapolis 1, Minn.

"Processing of Cod and Haddock Viscera: 1. Laboratory Experiments," by H. C. Freeman and P. L. Hoogland, article, Journal of the Fisheries Research Board of Canada, vol. 13, no. 6, November 1956, pp. 869-877, illus., printed. Queen's Printer, Ottawa, Canada. Annually, large amounts of cod and haddock viscera (minus livers) are discarded by the fishing industry. The chemical composition of this offal makes it a possible raw material for production of additives to animal feeds. Various processes that would lead to a method of production of such preparations were investigated and are reported in the present paper. Autolysis of fresh viscera in the presence of sodium nitrite as a preservative was found most attractive. Optimum conditions for this process were established and various methods of drying these autolysates were investigated.

CALIFORNIA:

California Cooperative Oceanic Fisheries Investigations, Progress Report, 1 April 1955 to 30 June 1956, 44 pp., illus., printed. State Fisheries Laboratory, California Department of Fish and Game, Terminal Island, Calif. A report on the progress of the California Cooperative Oceanic Fisheries Investigations for the period 1 April 1955 to 30 June 1956. In this report, the research agencies have reviewed their activities during the reporting period and have presented the following articles summarizing the status of their knowledge of three important marine fisheries: (1) "Anchovy," by Daniel J. Miller; (2) "Jack Mackerel," by John E. Fitch; (3) "Pacific Mackerel," by John E. Fitch; and (4) "Eggs and Larvae of Anchovy, Jack Mackerel," by Elbert H. Ahlstrom. Included in the report is an annotated list of publications which have arisen from research conducted under the investigations during the period 1 January 1955-30 June 1956.

CANADA:

(British Columbia) Provincial Department of Fisheries Report (with appendices) for the Year Ended December 31st, 1955, 134 pp., illus., printed. Provincial Department of Fisheries, Victoria, B. C., 1956. The first part of this report is devoted to an analysis of British Columbia's 1955 production and value of fishery products, the canned salmon pack, and a review of the salmon canning industry. Also discussed are the other canning industries (herring, tuna, and shellfish), the production of processed fish (mild-cured salmon, dry-salted salmon, and dry-salted herring), the halibut fishery, fish oil and fish meal, net fishing in nontidal waters, condition of British Columbia's salmon-spawning grounds, value of Canadian fisheries and the standing of the provinces for 1954, and species and value of fish caught in British Columbia. A report on the herring investigation and the 1955 report of the biologist on the oyster and clam investigations are included. The second section consists of the following articles: "Contributions to the Life History of the Sockeye Salmon (No. 41)," by D. R. Foskett; "The Status of the Major Herring Stocks in British Columbia in 1955-56," by F. H. C. Taylor, A. S. Hourston, and D. N. Outram; "Phytoplankton and Physical Conditions in Ladysmith Harbour," by C. D. McAllister; "The British Columbia Shipworm;" "Report of the International Pacific Salmon Fisheries Commission, 1955;" "Report of the International Pacific Halibut Commission, 1955;" and "Salmon-Spawning Report, British Columbia, 1955." The report concludes with detailed statistical tables on the British Columbia fisheries.

Journal of the Fisheries Research Board of Canada, vol. 13, no. 5, October 1956, pp. 599-758, illus., printed. Fisheries Research Board of Canada, Ottawa, Canada. Contains, among others, the following articles: "The Choice and Solution of Mathematical Models for Predicting and Maximizing the Yield of a Fishery," by Kenneth E. F. Watt; "Factors Influencing the Survival of the Lemon Sole (Parophrys vetulus) in Hecate Strait, British Columbia," by K. S. Ketchen; "On the Distribution of Young Sockeye Salmon (Oncorhynchus nerka) in Babine and Nilkitkwa Lakes, B. C.," by W. E. Johnson; and "The Oceanography of Hebron Fjord, Labrador," by David C. Nutt and Lawrence K. Coachman.

The First Ten Years of Commercial Fishing on Great Slave Lake, by Dr. W. A. Kennedy, Fisheries Research Board of Canada Bulletin 107, printed, 50 Canadian cents. The Queen's Printer, Ottawa, Canada. This bulletin is divided into two parts. The first part gives background information on the fishery of Great Slave Lake such as the physical and biological characteristics of the lake, the fish it contains, and the history and operational method of the fishery. The second part covers the scientific study that has been carried out prior to and since the inception of the fishery.

Progress Reports of the Pacific Coast Stations, no. 107, 32 pp., illus., printed. Fisheries Research Board of Canada, Ottawa, Canada,

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November 1956. Among the articles included are: "The Raft Culture of the Pacific Oyster in British Columbia," by D. B. Quayle; "The Effectiveness of Various Preservatives on Plywood in Preventing Attack by Shipworms and Gribbles," by F. H. C. Taylor; "Further Results from Tagging Experiments on Lingcod," by B. M. Chatwin; "The Distribution and Abundance of Early Post-Larval Stages of the British Columbia Commercial Crab," by T. H. Butler; and "Pacific Salmon Water?" by John P. Tully and A. J. Dodimead.

CANNING:

España Pesquera (Fishing Spain), vol. 1, no. 9, October 1956, 32 pp., illus., printed in Spanish. Sindicato Nacional de Pesca, Paseo del Prado, 20, sexta planta, Madrid, Spain. Contains, among others, the following articles: "Meeting of the Third Universal Congress of Canning Held in Rome;" "Speech Delivered by the President of the Congress;" "Summary of Some of the Reports of the Committees;" "The 11th International Fair of Canned and Packaged Goods held at Parma;" "Interviews with: M. Rene Manaut, President of the Permanent Committee of Canning; don Antonio Alfageme del Busto, President of the National Group; and don Jose Royo Iranzo, Pharmaceutical Chemist and Researcher;" and "Studies and Investigations of Canning Production in Morocco."

CARIBBEAN:

"Fisheries," article, The Caribbean, vol. 10, no. 4, November 1956, pp. 91-94, illus., printed. The University of Florida Press, Gainesville, Fla. Describes the progress made in the fisheries of the Caribbean area for the past ten years. During the period under review, attention was paid to the development of the fishing industry in the Caribbean area as a means of local food production, as an exporting industry, and as a means of providing employment. Between 1946 and 1956, legislation to protect, promote, and properly organize the fishing industry was passed in various countries. Describes development in the cultivation of fish; marketing, distribution, and storage of fish; fish processing; manufacture of fish meal; new methods of fishing; crawfish and lobster industries; formation of cooperatives; marine surveys and exploration; and the establishment of research stations throughout the Caribbean area.

CHILE:

Summary of Investigations on the Pelagic Fish Survey of Chilean Waters with Special Reference to the Swordfish, Marlins, and Tunas, by John A. Manning, No. 57-4, 14 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla.

COMMERCIAL FISHERIES:

Problems of the Commercial Fisheries Conservation, Technology, Economics, Contribution No. 19, 15 pp., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 84, 1955, pp. 299-313.) University of Washington, School of Fisheries, Seattle, Wash.

COMMISSIONS:

(International North Pacific Fisheries Commission) Annual Report for the Year 1955, 72 pp., illus., printed. International North Pacific Fisheries Commission, 209 Wesbrook Bldg., University of British Columbia, Vancouver 8, B.C., Canada, 1956. The Commission was established by Convention between Canada, Japan, and the United States for the conservation of the fisheries resources of the North Pacific Ocean on June 12, 1953. The present report contains a summary of action by the Commission at its 1955 annual meeting, which began on October 31 in Tokyo, a summary of administrative activities for the year, and progress reports on research conducted by the member governments under the Commission's program. The research program undertaken by the Commission is at present concentrated on determining the continental origin of stocks of salmon on the high seas and on determining whether there is a need for joint conservation measures for the king crab stock of the eastern Bering Sea. Canada's part in the program of research included: (1) a study of the skeletal anatomy of salmon, to seek structural differences which could be used to distinguish stocks of various origins; (2) an attempt to find parasites which can be used as indicators of the origin of salmon occurring on the high seas; (3) an attempt to catch and tag small sockeye, pink, and chum salmon to indicate migrations away from rivers of origin and the fisheries to which various stocks contribute; and (4) cooperation in a study of the oceanography of the North Pacific, to provide background for understanding salmon distribution and movements. Progress in all these fields was made in 1955 and is summarized in the present report. Japan's report summarizes operations of the mothership-type salmon fisheries in the Aleutian area during 1955 and presents data regarding salmon sampled aboard the motherships and data collected by the government research vessel, No. 1 Tsukiyama Maru, during the 1955 season. A summary of king crab research conducted by Japan in the eastern Bering Sea in 1955 is also included. The United States report discusses the offshore distribution of salmon, identification of stocks, study of movements by tagging, and oceanography; records of the commercial catch of king crabs, distribution and abundance of king crabs, relation of currents to distribution of young crabs, identification of stocks, growth and age determination, study of movements of crabs by tagging, and observations on the mortality of king crabs released from a trawl fishery.

CRABS:

Observations on the Life Histories and the Distribution of the Xanthidae (Mud Crabs) of Chesapeake Bay, by Edward Parsons Ryan, Contribution no. 104, 25 pp., illus., printed. (Reprinted from The American Midland Naturalist, vol. 56, no. 1, July 1956, pp. 138-162.) Chesapeake Biological Laboratory, Maryland Department of Research and Education, Solomons, Md.

CRAYFISH:

An Injection Method for Marking Crayfish, by Keith V. Slack, Contribution No. 564, 3 pp., printed. (Reprinted from Department of Zoology, 1955, pp. 36-38.) Indiana University, Department of Zoology, Bloomington, Ind.

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CUBA:

Cordel y Anzuelo (Line and Hook), by Adolfo Naranjo Betancourt, 252 pp., illus., printed in Spanish with a Spanish-English fish glossary. Banco de Fomento y Agricola e Industrial de Cuba, Seccion de Asuntos Pesqueros, Havana, Cuba, 1956. Discusses fisheries in Cuba and presents detailed descriptions of the 77 most important fishes found in Cuban waters. A picture of each fish is shown and also given are: its family name; species name in Latin; common Cuban name; type of fishery--whether commercial, sport, or both; places in Cuba where fished; outstanding characteristics; size--minimum, average, and maximum; what it feeds on; bait used and description of strike; season when most prevalent; spawning season; quality of its meat; commercial importance; and methods used for fishing. The book also has sections on the habitat of Cuban fish; markets; lists of fish family names and member species with equivalent common names; importance of the sardine; causes of death of live bait; the relationship of the geographic location of Cuba to its oceanography; importance of spiny lobster; facts about ambergris; the sponge industry; eels; oysters; bull frogs; fish hatcheries, crustaceans, turtles, and sponges; crab; statistical review of Cuban fishery during 1952; and a list of Cuban fish names mentioned and their English equivalents.

ELECTRICAL FISHING:

Die Electrofischerei (Electrofishing), by H. W. Denzer, Handbuch der Binnenfischerei Mitteleuropas, Band 5, Lieferung 3, 233 pp., 127 illus. and 49 tables, printed. E. Schweitzerbart'sche Verlagsbuchhandlung, Stuttgart, Germany, 1956. A clear and understandable handbook on the theoretical and practical problems of electrofishing. In addition to presenting stimulating suggestions for the future development of this type of fishing technique, the author has reviewed the historical development of electrofishing. There is also a detailed description of the requirements for the use of this method of capture, as well as descriptions of the physiological effects of electrical current and the factors that regulate the responses of the fish in an electrical field. The limitations of electrofishing are emphasized; and considerable space is allotted to the use of electrofishing equipment, including descriptions of a variety of European units. The author has outlined the methods and procedures of electrofishing as they apply to practical problems.

The Elementary Practice of Electrical Fishing in Fresh Water, Fisheries Notice 36, 15 pp., illus., printed. Ministry of Agriculture, Fisheries and Food, Whitehall Place, London, S. W. 1, England, August 1956. This leaflet was written to satisfy a demand for a simple, practical guide for those who are not electricians, but who propose to use an electrical method for purposes of fish conservation. Discusses the applicability, safety, and legality of electrical methods of fishing in fresh water; the electric field in water; action of electricity on fish; apparatus used in electric fishing; and electrode switch control. Also discusses fishing methods with alternating current and with direct current; practical considerations affecting the fishing; interrupted currents; and methods of production. A list of other papers on electrical fishing is included.

FISHERIES AGREEMENTS:

"Fish Can Be International," by Edwr Allen, article, United States Naval Institute Proceedings, October 1956, printed, 50 cents. United States Naval Institute, Annapolis, Md. Reviews the background of the various international fisheries agreements, beginning with the North Pacific Halibut Treaty--the first instance of international fishery management through a joint commission.

FISH PROTEINS:

"Fish Proteins and Their Utilization," article, Journal of Scientific and Industrial Research (India), vol. 14A, no. 9, p. 453, printed. Council of Scientific and Industrial Research, Delhi, India, 1955. The Department of Biochemistry, Institute of Science, Bombay, India, has been experimenting for the last four years on the preparation and utilization of proteins from fish, particularly from the waste muscle of shark, skate, ray, fish meal, etc. Considerable progress has been made in the preparation of edible proteins devoid of fishy smell. The fish proteins are easily digestible and contain all the essential amino acids in a fairly good proportion. The fish proteins have been prepared by a simple method similar to that described for the manufacture of Wiking Eiweiss--a German fish protein product. In vitro digestion with proteolytic enzymes and microbiological assay of the protein hydrolyzates for amino acids revealed that the fish proteins compare favorably with casein. The high concentrations of lysine, cystine, and other amino acids in fish proteins make it a valuable supplement to diets composed mainly of cereals, pulses, and vegetables. The fish proteins may find application in various industries like textiles, leather, dyes, confectionery, plastics, synthetic resins, and pharmaceuticals.

FLORIDA:

Papers from the Oceanographic Institute No. 2, Florida State University Studies Number Twenty-Two, 161 pp., illus., printed, $1. The Florida State University, Tallahassee, Fla., 1956. Contains, among others, the following papers: "The Demand for Florida Mullet," by William S. Engelson and Marshall R. Coldberg; and "The Fishes of Alligator Harbor, Florida, with Notes on Their Natural History," by Edwin B. Joseph and Ralph W. Yerger.

Quarterly Report on Fisheries Research, December 1956, No. 57-5, 8 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla. A report to the Florida State Board of Conservation on fisheries research covering small shrimp, spotted weakfish, snook, tarpon, sailfish, and gamefish. Studies were continued using the antioxidant sodium bisulfite to retard the development of black spot in shrimp. Samples of fresh frozen mackerel, treated with the antioxidant Ionol and tested over a period of one year, showed considerably less rancidity than did the nontreated samples.

Annotated Check-List of the Marine Fauna and Flora of the St. George's Sound--Apalachee Bay Region, Florida Gulf Coast, Contribution No. 61, 85 pp., processed. The Oceanographic

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Institute, Florida State University, Tallahassee, Fla., October 1956.

FLUKE:

"Long Island's Fluke (A Million Dollar Fishery)," by John C. Poole and Irwin M. Alperin, article, The New York State Conservationist, vol. 11, no. 3, December-January 1956-1957, pp. 16-17, illus., printed, single copy 50 cents. The Conservationist, Room 515, Arcade Bldg., Albany 1, N.Y. Describes some features of the early life history of the fluke or summer flounder and value to sports fishermen and commercial fishermen of Long Island, N.Y. It estimates conservatively that sport fishermen take about 2,000,000 pounds of fluke from Great South Bay and adjacent bays in an average season. The fluke catch per unit-of-effort in Great South Bay for 1938, 1955, and 1956 is shown by type of sport-fishing craft.

FOOD AND AGRICULTURE ORGANIZATION:

The Work of FAO, 1954-55 (Report of the Director-General), 130 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1955. While no year can be picked out of its context in the history and development of FAO, this report concentrates upon problems met and work accomplished since the last report to the council in 1954. Without detail, it relates to each Regular Program line of activity the pertinent projects under the Expanded Technical Assistance Program, thus reflecting the real and growing integration of direct technical advisory services to the continuing fundamental program. The chapter on fisheries shows an increase during the past year in the work of the Fisheries Division under both the Regular and the Expanded Technical Assistance Programs, and discusses its accomplishments. Work on the survey of living aquatic resources of the world was pressed forward and so was the task of bringing about international improvements in the standards of methods of fishery statistics. Developments during the year in fisheries biology, fisheries technology, fishery economics and statistics, and regional activities are discussed in detail.

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The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of Chile on Increasing Fish Consumption (based on the work of John Fridthjof), FAO Rpt. No. 271, 53 pp., processed, April 1954.

Informe sobre la Langosta Migratoria de la America Central y Mexico (Report on the Migratory Spiny Lobster of Central America and Mexico), FAO Rpt. No. 287, 23 pp., processed in Spanish, August 1954.

Informe al Gobierno del Ecuador sobre Fomento de la Pesca Maritima (Report to the Government of Ecuador on the Development of Maritime Fishery), FAO Rpt. No. 325, 25 pp., processed in Spanish, January 1955.

Report to the Government of Liberia on Fishing Boats, Gear and Methods, by Hubertus van Pel, FAO Rpt. 322, 36 pp., illus., processed, November 1954. Discusses a survey to improve the fishing methods in Liberia. The first two phases of the program covered preparatory work ashore, including the training of Liberian assistants in net making and the erection of certain shore installations. The third phase consisted of the main project, the demonstration of, and training in, improved fishing methods from small mechanized boats.

Informe al Gobierno de la Republica de Panama sobre Investigacion de los Recursos Camaroneros, Octubre 1952-Octubre 1953 (Report to the Government of Panama on the Shrimp Resources, October 1952-October 1953), by Leslie Scattergood, FAO Rpt. No. 326, 76 pp., illus., processed in Spanish, March 1955.

Informe al Gobierno de la Republica Dominicana sobre Piscicultura (Report to the Government of the Dominican Republic on Fish Culture), by S. Y. Lin, FAO Rpt. No. 346, 17 pp., illus., printed in Spanish, December 1954.

Report to the Government of India on Development of the Sundarbans Fisheries in West Bengal, FAO Rpt. No. 347, 24 pp., illus., processed, December 1954. A report on the development of a program for increasing fish production in the brackish waters of the State of West Bengal through the introduction of suitable foreign gear and craft; improvement of existing indigenous gear and craft; improvement of the present water transport system for carrying fish; and training local fishermen to organize and operate fishing ventures in brackish waters.

Report on the Indo-Pacific Fisheries Statistics Training Center held in Bangkok, Thailand, 19 June to 31 July, 1952, by G. L. Kesteven, FAO Rpt. No. 357, 59 pp., processed, February 1955. The principal aim of the Center was to give practical instruction in statistical work for fisheries to officers of governments of the region, to equip them better to undertake the statistical program for these industries. The organization of the Center in Bangkok, work of the Center, and results achieved are discussed.

Report to the Government of Turkey on Fishery Biology, FAO Rpt. No. 391, 25 pp., processed, July 1955. This report deals with the work on fishery biology conducted by Dr. G. A. Rounsefell who was on loan to FAO from his position with the Fish and Wildlife Service to assist the Government of Turkey in promoting fishery development.

FOOD CONSUMPTION:

Food Consumption of Households in the United States, Household Food Consumption Survey 1955 Report No. 1, 196 pp., processed, $1.25. U.S. Department of Agriculture, Washington, D.C., December 1956. (For sale by the Superintendent of Documents, U.S. Government

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Printing Office, Washington 25, D. C.) This report contains a portion of the data from the U. S. Department of Agriculture's nationwide Survey of Household Food Consumption made in the spring of 1955. The survey was part of the Department's broad program of research on the marketing and utilization of farm products and on family dietary levels. The 6,060 households included in the survey were from all over the country, in urban, in rural nonfarm and farm areas. These households represent all income classes. The report gives information on patterns of consumption and money value for over 200 food items, including fish and shellfish. The information will be useful to many kinds of food businesses and to others in determining the demand for the major types of foods.

FROZEN FISH:

Frozen Fish (Improved Quality and Packing as a Way to Improved Marketing and Consumption), Project No. 325, 160 pp., illus., printed, US$1.25. O. E. E. C. Mission, Suite 61, 2002 P St., N. W., Washington 6, D. C. Following a recomendation of the O. E. E. C. Sub-Committee on Fisheries, a training course on "The Improved Quality and Packing of Frozen Fish" was held at Kiel, Germany, from March 14-19, 1955. This training course, which is the subject of the present publication, was attended by some 50 delegates from 14 member countries of O. E. E. C. The report was compiled by the course organizers and includes the country statements presented at the training course, the technical papers read, and a summary of the conclusions and recommendations reached by the participants during their discussions. The purpose of the workshop was to provide the participants with a comprehensive survey of recent developments in the fish-freezing industry and allow for detailed discussions not only on technical questions, but also on economic problems, ranging from the condition of the raw material and the various methods of deep-freezing down to the particularly interesting methods of transport and distribution. It was one of the main objects of the workshops that every participant should acquire practical knowledge from the papers and group discussions for application in his home country. The workshop, therefore, was not limited to theoretical discussions, but gave prominence to methods of immediate practical application throughout the fish industry. But first of all, it was the object to demonstrate how important the deep-freezing of fish is to promote an increase in the consumption of this commodity. Part I of the present report describes the fish-freezing industry in the participating countries. Part II gives the full text of the technical papers delivered at the training course and summaries of discussions. The program and itinerary of the workshop and a list of the participants are also included.

GEAR:

"A Comparison of Mesh-Measuring Methods," by B. B. Parrish, R. Jones, and J. A. Pope, article, Journal du Conseil, vol. XXI, no. 3, June 1956, pp. 310-318, illus., printed, single copy Kr. 12 (US$1.74). Messrs. Andr. Fred. Høst & Søn, Bredgade, Copenhagen, Denmark.

"On the Selection of Hake and Whiting by the Mesh of Trawls," by J. A. Gulland, article, Journal du Conseil, vol. XXI, no. 3, June 1956, pp. 296-309, illus., printed, single copy Kr. 12 (US$1.74). Messrs. Andr. Fred. Høst & Søn, Bredgade, Copenhagen, Denmark.

GENERAL:

1954 Census of Manufacturers, Advance Report (Canning, Preserving, and Freezing), Series MC-20-3, 16 pp., processed, 10 cents. Bureau of the Census, U. S. Department of Commerce, Washington 25, D. C. This advance report includes selected preliminary statistics from the 1954 Census of Manufacturers for the canning, preserving, and freezing group of industries. Among the individual industries included in this report are the following: Canned Seafood Industry (S. I. C. Code 2031)--represents manufacturing establishments primarily engaged in cooking and canning fish, shrimp, oysters, clams, crabs, and other fishery products; Cured Fish Industry (S. I. C. Code 2032)--represents manufacturing establishments primarily engaged in smoking, salting, drying, or otherwise curing fish for the trade; and Packaged Seafood Industry (S. I. C. Code 2036)--represents manufacturing establishments primarily engaged in preparing fresh or frozen packaged fish or other fishery products; and also includes establishments primarily engaged in the shucking and packing of fresh oysters in nonsealed containers. This advance report gives general statistics (employment, payrolls, cost of materials, value of shipments, etc.) for 1954 and 1947 by regions and states, and the quantity and value of fishery products shipped by all manufacturing establishments for the United States.

Diseases of Fishes, by C. Van Duijn, Jr., 187 pp., illus., printed. Water Life, Dorset House, Stamford St., London, S. E. 1, England. A comprehensive and well illustrated book dealing with fish diseases and their treatment. The introduction discusses the sources of infection, general indications of good and ill-health, diagnosis of disease, and anatomy of fish. There are eight chapters dealing with skin parasites and infections; diseases of the gills; diseases caused by sporozoans; diseases caused by bacteria and viruses; diseases of the eye; diseases of the internal organs; miscellaneous complaints; and the medicine chest. Not only will the most modern and effective cures be found here but also methods of treatment which have been advocated in the past and must now be considered obsolete, the reasons being given why they can no longer be recommended. In this way the material, as it is presented, may be considered comprehensive, combining information from British, American, and Continental sources with the writer's personal experiences. The details should be comprehensible to aquarists in different parts of the world as prescriptions are given not only in British units but in American and metric units as well.

Economic Report of the President (Transmitted to the Congress, January 23, 1957), House Document No. 29, 85th Congress, 1st Session, 210 pp.,

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illus., printed. United States Government Printing Office, Washington 25, D.C., 1957.

Fishes: A Guide to Fresh- and Salt-Water Species, by Herbert S. Zim and Hurst H. Shoemaker, A Golden Nature Guide, 160 pp., illus., printed, $1. Simon and Schuster, Inc., 630 Fifth Ave., New York 20, N.Y. A general guide for identifying fish on a fishing trip or in an aquarium.

(Interstate Commerce Commission) 70th Annual Report, November 1, 1956, House Document No. 12, 85th Congress, 1st Session, 240 pp., illus., printed. U.S. Government Printing Office, Washington 25, D.C., 1957. The purpose of this report is to give an account of the Interstate Commerce Commission's activities for the period extending from November 1, 1955 to October 31, 1956, and to inform the Congress of problems and conditions in transportation which require its early consideration. These problems are discussed, and where legislation is deemed necessary, specific recommendations are made in the final chapter.

Limnology and Oceanography, vol. 1, no. 1, January 1956, printed (subscription rate for libraries and non-members of the Society, $10 per year). American Society of Limnology and Oceanography, Woods Hole Oceanographic Institution, Woods Hole, Mass. A new serial publication for those concerned with aquatic sciences and to provide a common medium for technical papers on the varied specialties which unite to increase an understanding of the aquatic environment. The first volume includes the following papers: "Environmental Factors Affecting Growth in Venus mercenaria," by D. M. Pratt and D. A. Campbell; "Algal Indicators of Trophic Lake Types," by D. S. Rawson; "Population Dynamics of the Marine Clam, Mya arenaria," by J. C. Ayers; "Deep Standing Internal Waves in California Basins," by K. O. Emery; "The Stress-Drop Jet in Lake Mendota," by R. A. Bryson and W. W. Bunge, Jr.; "Artificial Eutrophication of Lake Washington," by W. T. Edmondson, G. C. Anderson, and D. R. Peterson; "Observations on Dinoflagellate Blooms," by L. R. Pomeroy, H. H. Haskin, and R. A. Ragotzkie; and "Photosynthesis in the Ocean as a Function of Light Intensity," by J. H. Ryther.

The Use of Copper Sulphate to Increase Fyke Net Catches, by William A. Tompkins and Colton Bridges, 12 pp., illus., processed. Division of Fisheries and Game, Department of Natural Resources, 15 Ashburton Place, Boston 8, Mass.

The World of Water, by George G. Harrap and Co., printed, 13s. 1d. (about US$1.85). Piscatorial Press, Ltd., 110 Fleet St., London, E.C. 4, England. Tells of the many types of marine life under the sea, their weapons of defense against enemies and the struggles between sea animals for survival.

HAWAII:

Konohiki Fishing Rights, by Richard H. Kosaki, Report No. 1, 41 pp., illus., processed. Legislative Reference Bureau, University of Hawaii, Honolulu, Hawaii, 1954. Discusses arguments for and against condemnation of the ancient Hawaiian Konohiki fishing rights--private ownership rights over ocean fisheries--which are recognized as property rights by the United States Supreme Court.

HYDROGRAPHY:

"The Influence of Hydrographic Conditions on the Behavior of Fish," compiled by Richard H. Fleming, article, FAO Fisheries Bulletin, vol. IX, no. 4, October-December 1956, pp. 181-196, illus., printed, single copy 30 cents. Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N.Y. In the introduction of this preliminary literature survey, the author states that, "A commercial fishery will be profitable only if a high concentration of fish may be found in a restricted locality. In order to be able to predict the locality and time of aggregation of commercial fish, the factors determining such aggregations must be identified and measured. Furthermore, the factors which determine successful propagation of the fish stock, its size, and survival rate must be found and identified too, in order to be able to take proper steps in management and fish conservation." The notes that follow discuss organic production in the open oceans, food chains in the ocean, temperature changes, salinity of the water, other physical and chemical environmental factors, currents, and food and feeding habits.

IDAHO:

Statewide Fishing Harvest Survey, 1955 (Annual Progress Report for Investigations Projects), by Forrest R. Hauck, Federal Aid to Fisheries Project 18-R2, 10 pp., illus., printed. Fish and Game Department, Boise, Idaho, 1956.

INDIANA:

Fish and Fishing in Spear Lake, Indiana, by W. E. Ricker, Contribution No. 588, 45 pp., illus., printed. (Reprinted from Department of Zoology, 1955, pp. 117-161.) Indiana University, Department of Zoology, Bloomington, Ind.

IOWA:

Quarterly Biology Reports, vol. VIII, no. 3, July-August-September 1956, 44 pp., processed. State Conservation Commission, East 7th and Court St., Des Moines, Iowa. Contains the following articles: "Summary of the Cooperative Exploratory Fishing Operations in the Wisconsin-Illinois-Iowa Sections of the Mississippi River, 1956," by R. E. Cleary; "An Experimental Treatment of a Segment of the Des Moines River in Iowa to Increase Desirable Fish by Suppressing Undesirable Forms," by Harry M. Harrison; "Selective Poisoning of Gizzard Shad in Storm Lake--Preliminary Report," by Earl Rose; "Results of Early Summer Creel Census of Five Northern Iowa Lakes, 1956," by Tom Moen; and "The 1956 Artificial Lakes and Reservoir Fisheries Survey," by Jim Mayhew.

JAPAN:

The Tohuku Journal of Agricultural Research, vol. VI, no. 4, pp. 285-392, illus., printed, March 1956. Faculty of Agriculture, Tohuku University, Sendai, Japan. Contains, among others, the following articles: "Biological Studies on the

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Population of the Saury, Cololabis saira (Brevoort). Part 2--Habits and Migrations," by M. Hatanaka; and "Comparative Biochemical Studies on Aquatic Animals. I.--Calcium Turnover of the Freshwater Fish and Shellfish," by Motokazu Asano, Masao Ito, and Toshio Kumagai.

REPUBLIC OF KOREA:

Rehabilitation & Reconstruction Program on Marine Affairs, 1957-1961, 92 pp., illus., printed. Office of Marine Affairs, Seoul, Republic of Korea, 1956. A detailed report on Korea's rehabilitation and reconstruction program. Part I describes the following projects: (1) oyster cultivation which will replace laver (a species of seaweed) culture; (2) replacement of existing old and unseaworthy vessels; and (3) completion of the second tidal basin work at Inch'on. Part II covers a 5-year plan on fisheries rehabilitation; shipbuilding; modernization of stevedoring facilities; and harbor rehabilitation.

MAINE:

Alewife Management in Maine, by Frederick T. Baird, Fisheries Circular No. 18, 7 pp., processed. Department of Sea and Shore Fisheries, State House, Augusta, Maine, November 1956. A report on the alewife management program in Maine, presenting biological information which might serve to change to some degree the recommendations for the management of the fishery. The recommendations made in 1953 remain basically unchanged and are as follows: (1) all areas should be carefully checked for their production capacity and the possibility of even greater production either by opening more of the watershed or more efficient use of that portion which is available; (2) more rapid development of potential areas should be encouraged; (3) a careful check of fishway construction and maintenance should be carried on; and (4) where new runs are being developed, plans should be made for the planting of adults as required. The author concludes that (1) under present conditions, alewife production can be increased by (a) the improvement of existing runs, and (b) the rehabilitation of runs which are no longer commercially productive; (2) existing markets are capable of absorbing additional production; and (3) it is now feasible to develop small producing areas which are closely joined geographically to form a single development and marketing unit.

The Maine Department of Inland Fisheries and Game, by Ron Speers, Information and Education Division Pamphlet No. 4, 14 pp., illus., printed. Department of Inland Fisheries and Game, Augusta, Maine, 1956.

MALAYA:

Report of the Fisheries Division, 1955, Ministry of Commerce and Industry, 27 pp., printed. Ministry of Commerce and Industry, Singapore, Malaya. Includes a general review of the fishing industry of the Federation of Malaya, availability of fresh fish, prices of fresh fish, trade in dried salt fish and certain marine products, and cost of fishing materials.

MARINE LIFE:

The Underwater Guide to Marine Life, by Carleton Ray and Elgin Ciampi, 338 pp., illustrated by Teiji Takai, printed, $8.75. A. S. Barnes and Company, 232 Madison Avenue, New York 16, N. Y., 1956. As suggested by the title, this is specifically a book for the large and growing group who have discovered the fascinating world under water and who insist upon diving to explore it with or without special breathing apparatus. The authors have included introductory chapters on marine biology and oceanography which are readable and interesting condensations of those phases of the subjects most important to an understanding of the varied and colorful life described in the remaining pages. The general accuracy is high. The illustrations are excellent and the photographs and color plates are not only original but good. The importance of conservation of natural conditions and life on accessible reef areas is stressed and the well rounded synoptic treatment of marine plants and both marine invertebrates and vertebrates should make the book a useful reference work for fishermen and adventurers as well as to those of us who merely wish that we had the time and energy to look under the sea for ourselves.

--Stewart Springer

MARYLAND:

Annual Report, 1954, by R. V. Truitt, Educational Series No. 39, 32 pp., illus., printed. (Reprinted from Eleventh Annual Report, Maryland Board of Natural Resources, 1954.) Chesapeake Biological Laboratory, Maryland Department of Research and Information, Solomons, Md., August 1955. Reports on Maryland's natural resources and includes discussions on oyster and clam investigations, fish and fisheries problems, crabs, marine borers, fish conservation projects, Chincoteague Bay studies, and hydrography.

Annual Report, 1955, by L. Eugene Cronin, 33 pp., illus., printed. (Reprinted from Twelfth Annual Report, Maryland Board of Natural Resources.) Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md., August 1956. Reports on Maryland's most important natural resources and primarily discusses shellfish, crabs, fish and fisheries, and hydrography of the Chesapeake Bay regions; Chincoteague Bay studies; and inland fish investigations.

MOLLUSKS:

Freshwater Mollusks of Alabama, Georgia, and Florida from the Escambia to the Suwannee River, by William J. Clench and Ruth D. Turner, Bulletin of Biological Sciences, vol. 1, no. 3, 1956, 239 pp., illus., printed, $1.80. University of Florida, State Museum, Gainesville, Fla.

NORWAY:

Konkylien (The Shell), vol. 1, no. 1, December 1956, 30 pp., illus., printed in Norwegian with summary in English. Stord Marin Industri A/S, Bergen, Norway. The first issue of a technical publication which will be published 3 or 4 times a year and will include news regarding fishing and the fish meal industries. It is intended to give up-to-date information about matters directly connected with the activities of the Stord

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Marin Industri A/S and S. Bartz-Johannessen and associated companies, together with news of production and sales of herring meal and oil, fish meal, solubles, and seaweed meal. There will be included details of new plants, the sale and deliveries of industrial equipment and apparatus, the planning of factory plants, etc., both in Norway and abroad. Summaries in English are given of the following articles: "The Rotadisc Steam-Heated Drier (Of Novel Construction and Greatly Reduced Dimensions);" "Tobis, a Raw Material for Fish Meal Plants;" and "Caplin, for Food and Industrial Purposes."

Norges Fiskerier, 1953 (Fishery Statistics of Norway), Norges Offisielle Statistikk Series XI, no. 237, 113 pp., illus., printed in Norwegian with foreword, table of contents, and summary in English. Director of Fisheries of Norway, Bergen, Norway, 1956. A detailed statistical report on the fisheries of Norway with discussions of the number of fishermen, craft, processing plants, gear; quantity and value of total landings; herring, sprat, cod, mackerel, tuna, dogfish, and caplin fisheries; fisheries in distant waters; and catch of small whales and sealing. Statistics are given on quantity, value, and average prices of all species of fish caught commercially. The following new tables have been included: trawl fishing in West Greenland waters; long-lining in West Greenland waters; Icelandic herring fisheries; participation, duration of trips and landings, by tonnage groups and type of fishing gear; landings from distant waters, by counties; and catch of fat and small herring by months for each county. Also contains a list of scientific and common names, in four different languages, of fish, crustaceans, mollusks, and other aquatic organisms in Norwegian waters; drawings of the principal species of fish, mollusks, and crustaceans; and drawings of the different types of fishing gear.

OREGON:

Oregon's Warm-Water Game Fish, Informational Leaflet No. 9, 4 pp., illus., printed. Department of Information and Education, Game Commission, Portland, Ore.

OYSTERS:

"Deterioration of Cooked Southern Oysters," by Elizabeth Ann Gardner and Betty M. Watts, article, Food Technology, vol. 11, no. 1, January 1957, pp. 6-11, printed, single copy: domestic, $1.50; foreign, $1.75. The Garrard Press, 119 West Park Ave., Champaign, Ill. Describes a study of the rate and type of spoilage which occurs in cooked oysters. Raw southern oysters were found to give an exceptionally strong qualitative test for the enzyme catalase with 3-percent hydrogen peroxide. This test was used to indicate inactivation of this enzyme by heat treatment. Spoilage which took place in oysters cooked enough to inactivate catalase and subsequently frozen or refrigerated appeared to be of an oxidative type, characterized by a rancid fish odor. By adding various antioxidants to the cooking water, this type of spoilage was retarded. Weight losses during cooking were influenced more by length of cooking time than by type of cooking method. Further losses of liquid took place upon refrigerated storage of the cooked oysters.

Distribution of Oyster Larvae and Spat in Relation to Some Environmental Factors in a Tidal Estuary, by Joseph H. Manning and H. H. Whaley, Contribution no. 105, 10 pp., illus., processed. (Reprinted from the Proceedings of the National Shellfisheries Association, vol. 45, August 1954, pp. 56-65.) Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

Oyster Culture in South Africa, by Dr. P. Korringa, Investigational Report No. 20, 86 pp., illus., printed. (Reprinted from Commerce and Industry, March 1956. Department of Commerce and Industries, Divis... of Fisheries, Pretoria, Union of South Africa, 1956.

Various Aspects of Oyster Setting in Maryland, by G. Francis Beaven, Resource Study Report No. 8, 9 pp., illus., processed. (Reprinted from the Proceedings of the National Shellfisheries Association, vol. 45, August 1954, pp. 29-37.) Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

PAKISTAN:

Marine Fishes of Karachi and the Coasts of Sind and Makran, 80 pp., illus., printed. Government of Pakistan, Ministry of Food and Agriculture, Central Fisheries Department, Karachi, Pakistan, 1955.

PRESERVATION:

"Characteristics of Electron-Irradiated Meats Stored at Refrigerator Temperatures," by J. F. Kirn, W. M. Urbain, and H. J. Czarnecki, article, Food Technology, vol. 10, no. 12, December 1956, pp. 601-603, printed, single copy $1.50. (Published by the Institute of Food Technologists.) The Garrard Press, 119 West Park Ave., Champaign, Ill.

QUALITY:

"A Rapid Vacuum Distillation Procedure for the Determination of Volatile Acids and Volatile Bases in Fish Flesh," by Tetuo Tomiyama, Antonio A. da Costa, and Joseph A. Stern, article, Food Technology, vol. 10, no. 12, December 1956, pp. 614-617, illus., printed, single copy $1.50. (Published by the Institute of Food Technologists.) The Garrard Press, 119 West Park Ave., Champaign, Ill.

REFRIGERATION AND FREEZING:

"Zur Frage des Fischgefrierens auf See (The Problem of Freezing Fish at Sea)," by Dr. J. Kuprianoff, article, Kaltetechnik, vol. 8, no. 4, April 1956, pp. 114-121, illus., printed in German. Deutschen Kaltetechnischen Vereins, Karlsruhe, Germany. Surveys the economic aspects of the problem, quality of the fish when landed, current interest in freezing fish at sea, and operational experience gained by British, German, and Soviet freezing trawlers. The form in which fish is frozen has an essential bearing on the freezing procedure and type of refrigeration plant. Freezing of whole fish is simpler and does not involve much space or costly investment, but freezing of filleted fish is expensive since it involves additional operations such as sorting, washing, heading, filleting, and packaging. Fillets and

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steaks are frozen in metal molds but use of plastic sheets is recommended to prevent undesirable complications which may result from contact and sticking to the metal. Freezing fish at sea presents no fundamental technical difficulties and the problems are regarded as chiefly of an economic nature.

SEA LAMPREY:
"The Questionable Sea Lamprey," by Justin W. Leonard, article, Michigan Conservation, vol. XXVI, no. 1, January-February 1957, pp. 19-21, illus., printed. Michigan Department of Conservation, Lansing, Mich.

SALMON:
Aroostook River Salmon Restoration and Fisheries Management, by Kendall Warner, Fishery Research Bulletin No. 4, 66 pp., illus., printed. (Published jointly by Maine Department of Inland Fisheries and Game and Atlantic Salmon Commission.) Department of Inland Fisheries and Game, Augusta, Maine, 1956.

Babine River Salmon after Removal of the Rock Slide, by H. Godfrey, W. R. Hourston, and F. C. Withler, printed, 50 cents. Fisheries Research Board of Canada, Ottawa, Canada.

Conference on Pink Salmon of the Fraser River Area Between the United States of America and Canada (Proceedings of Plenary Sessions and Precis of Committee Meetings), 70 pp., processed. Conference on Pink Salmon of the Fraser River Area, Room 118, House of Commons, Ottawa, Canada, October 22-25, 1956.

King Salmon and the Ocean Troll Fishery of Southeastern Alaska, by Robert A. Parker and Walter Kirkness, Research Report No. 1, printed. Alaska Department of Fisheries, Juneau, Alaska. Gives the statistical history of the troll salmon catch in Southeastern Alaska.

Machias River Salmon Restoration, by James S. Fletcher, 25 pp., illus., printed. Atlantic Salmon Commission, Augusta, Maine, 1955.

SEA SCALLOP:
The Maine Sea Scallop Fishery, by Robert L. Dow, Fisheries Circular 19, 9 pp., illus., processed. Department of Sea and Shore Fisheries, State House, Augusta, Maine, December 1956. The sea scallop, Pecten magellanicus, is Maine's fifth most valuable fishery. This paper discusses the commercial history of the sea scallop fishery and includes statistics on the production and value of the fishery for the period 1942-55. Also describes biological research, managemen. recommendations, offshore fishery, winter fishery, extent of inshore scallop fishing operations, fishing efficiency, demand and abundance, mortalities, and future development of the inshore fishery.

SEAWEED:
Seaweed Prospects, 30 pp., illus., printed. Institute of Seaweed Research, Inveresk, Midlothian, Scotland, March 1956. Describes the commercial exploitation and use of seaweed in the chemical, pharmaceutical, textile, food, and fertilizer industries. A summary of the Institute's technical findings, which should be of value to firms engaged or interested in seaweed utilization, covers the supply position of brown seaweed and red seaweed, development of harvesting machinery, value of seaweed in animal feedstuffs and as fertilizer in the soil, seaweed chemicals, and the development of commercial outlets for seaweed and seaweed chemicals. Data sheets are appended which give summarized details of the preparation, properties, derivatives, and uses of ascophyllum meal, laminaria meal, alginic acid and the alginates, d-mannitol, laminarin, fucoidin, fucosterol, agar, and carrageenin.

SHRIMP:
"Chemical Ices for Shrimp Preservation," by E. A. Fieger, M. E. Bailey, and A. F. Novak; and "Factors Influencing the Sporadic Development of Discoloration in Canned Wet Pack Shrimp," by R. G. Landgraf, Jr., articles, Food Technology, vol. 10, no. 12, December 1956, pp. 578-583 and 607-610, respectively, illus., printed, single copy $1.50. (Published by the Institute of Food Technologists.) The Garrard Press, 119 West Park Ave., Champaign, Ill.

SOUTH CAROLINA:
Annual Report, 1955-1956, Contribution No. 24, 19 pp., illus., printed. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1955-June 30, 1956.) Bears Bluff Laboratories, Wadmalaw Island, S. C., January 1957. A detailed description of the activities of Bears Bluff Laboratories for the period under review, covering the study of oysters, shrimp, crabs, finfish, and salt-water ponds. Also describes offshore explorations with Bears Bluff's deep-sea research vessel, the 65-foot T-19.

STRIPED BASS:
Recaptures of Tagged Striped Bass, ROCCUS Saxatilis (Walbaum), Caught in Deep Water of Chesapeake Bay, Maryland, by Romeo Mansueti, Resource Study Report No. 10, 9 pp., illus., processed, October 1956. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

SWEDEN:
Swedish Investigations on Ling (MOLVA VULGARIS Fleming), by Arvid R. Molander, Series Biology, Report No. 6, 39 pp., illus., printed. Institute of Marine Research, Fishery Board of Sweden, Lysekil, Sweden, 1956.

TAGGING:
Notes on Marking Live Fish with Biological Stains, by Arnold Dunn and Coit M. Coker, Contribution no. 86, 4 pp., illus., printed. (Reprinted from Copeia, no. 1, March 21, 1951, pp. 28-31.) Chesapeake Biological Laboratory, Maryland Department of Research and Education, Solomons, Md.

TENNESSEE VALLEY AUTHORITY:
Annual Report for 1956 (A Record of Activities and Accomplishments for the Fiscal Year Ending June 30, 1956), Report No. 216-56, 56 pp., illus., processed. Division of Forestry Relations, Tennessee Valley Authority, Norris, Tenn. Includes,

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among others, a chapter on fish and game investigations which describes fish population studies, fish creel census, harvesting studies, the Norris Reservoir netting study, fish stocking in TVA reservoirs, commercial fishing, and the mussel industry. Statistics are also presented on the quantity and value of the commercial species of fish taken in the Guntersville, Wheeler, Wilson, and Pickwick Reservoirs, and the mussel shell harvest of the Lower Mainstream Reservoirs.

TROUT:

An Evaluation of Massachusetts' Trout Stream Fishery, by James W. Mullan, 11 pp., processed. Division of Fisheries and Game, Upton, Mass.

TURKEY:

"Turk Balikci Tekneleri" (On the Turkish Fishing Boats), by H. I. Chapelle and M. N. Ozerdem, article, Balik ve Balikcilik (Fish and Fishery), vol. V, no. 1, January 1957, pp. 14-18, illus., printed in Turkish. Et ve Balik Kurumu, Istanbul, Turkey.

UNTED KINGDOM:

Herring Industry Accounts, 1955-56, 7 pp., printed. Her Majesty's Stationery Office, London, England. Shows the sums received and paid out of the Herring Marketing Fund for the purpose of making loans in connection with export, or for undertaking operations involving the outlay of working capital (chiefly in connection with the Herring Industry Board's herring meal and oil schemes). Also shows receipts from repayments of the principal of such advances, and receipts and advances connected with the acquisition of new fishing vessels and of new engines for vessels belonging to working fishermen. Advances from the Fund during the year ended March 31, 1956, were to provide working capital. No advances were made during the year in respect to schemes connected with export. Loans connected with export made in earlier years have been repaid in full.

Sea Fisheries, Their Investigation in the United Kingdom, edited by Michael Graham, 487 pp., illus., printed. Edward Arnold (Publishers) Ltd., London, England, 1956. A generously illustrated book that discusses past and present main findings of fisheries laboratories in the United Kingdom. Presents detailed reports on the following subjects: origin of fishery science in the United Kingdom; general knowledge of demersal and pelagic fisheries of the United Kingdom and development of fishery statistics; plankton; benthos and shellfish; the pelagic phase; biology, fishery, and economic importance of cod, haddock, hake, and plaice; and the theory of fishing. Also has an excellent bibliography.

VESSELS:

"Operations of Modern Fishing Craft," article, Trade News, vol. 9, no. 5, November 1956, pp. 3-7, illus., printed. Director of Information and Educational Service, Department of Fisheries, Ottawa, Canada. Reviews the 1955 report of a study conducted by the Department of Fisheries of Canada on the economics of modern fishing-craft operations in the Atlantic Coast area. Includes tables and excerpts from the report's summary of analysis of findings; descriptive material with respect to fishing boats; gear, and operational methods; categories of capital cost; problems of financing and related topics; and details of 1955 accounts.

VIRGINIA:

(Commission of Game and Inland Fisheries) Annual Report for the Fiscal Year Ending June 30, 1955, 41 pp., printed. Division of Purchase and Print, Commission of Game and Inland Fisheries, Richmond, Va., 1956.

YEARBOOKS AND DIRECTORIES:

Fisheries Yearbook and Directory, 1956, edited by Harry F. Tysser, 462 pp., illus., printed. British-Continental Trade Press Ltd., 222 Strand St., London W.C. 2, England. An international reference book and directory of the fishing and fish-processing industries. It covers the world's fish catches, curing, canning, quick-freezing, consumption, imports and exports, technological progress, and other items of importance. The book contains two parts, the first of which is composed of the following articles: "The British Fishing Industry;" "English Fishery Research in 1955," by Michael Graham; "Denmark's Fishing Industry," by Chr. Christiansen; "The Fishing Industry of the Federal Republic of Germany," by Dr. G. Meseck; "Around the World," a report on the fishing industries and fishery activities of Argentina, Australia, Belgium, Canada, Formosa, East Zone of Germany, Japan, Netherlands, Norway, Poland, South Africa, United States, U.S.S.R., and Yugoslavia; "Preservation of Fish," by K. Beck-Slinn; "Fish Processing Equipment;" "Practical Guide to Fish Products and Treatment," by Eric Hardy; "How to Plan a Fish Meal Plant," by Olaf Braten; "Organization and Trade Associations;" "Trade Journals of Interest to the Fishing Industry;" "Fish Suppliers Calendar;" "Dictionary of Fish Names;" "Fishing Vessel Construction and Equipment;" "Recent Shipbuilding and Engineering Developments;" "Progress in Quick-Freezing;" and "Icelandic Fisheries and Exports." The second part of the book is a directory section which contains the following ten parts: (1) exporters, curers, quick-freezers, trawler owners; (2) importers and wholesalers; (3) fish canners and preservers; (4) machinery and equipment for fish processing and refrigeration; (5) packing machinery, materials, etc.; (6) supplies for fisheries; (7) fishery byproducts; (8) cold-storage and transport; (9) list of trade marks and names; and (10) buyer's guide and classified list of advertisers. The wide scope and detailed subject matter covered make this book valuable as a guide to the world's fisheries.

Statistical Year Book, 1956, International Tin Study Group, 284 pp., printed, $5.60. International Tin Study Group, 7 Carel van Bylandtlaan, The Hague, Netherlands. A yearbook presenting statistics and general reports of the tin-producing and tin-consuming industries of the world. The book has two parts, the first of which deals with tin and tinplate. The second part of the book deals with the canning industry and presents, among others, a brief report of production of canned fish by countries throughout the world.

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The second part also contains sections on Africa, North America, Central America, and the West Indies, South America, Asia, Europe, and Oceania, and presents, among other products, detailed reports and statistics of fish canning for each general area and each country within the areas.

WASHINGTON:
Washington State Department of Fisheries, 65th Annual Report, 1955, 64 pp., illus., printed. Washington State Department of Fisheries, Seattle, Wash., December 1956. Discusses the activities and objectives of the Department of Fisheries for the year 1955, with a review of fisheries progress. The Department's program of research and management of marine fish and shellfish is discussed in considerable detail and covers research at power dams, salmon culture, marine and stream research, shellfish research, the salmon fishery, stream improvement and salmon restoration, and cooperative research and management programs. Also includes sections on fisheries patrol, legislation, fisheries news log, 1955 regulation changes, escapement counts of sockeye and silver salmon at Baker River Dam, and White River escapement counts of silver and chinook salmon at Mud Mountain trap.

WHALES:
The Scientific Reports of the Whales Research Institute, No. 11, 218 pp., illus., printed, June 1956. The Whales Research Institute, No. 4, 12 Chome, Nishigashidori Tsukishima, Chuo-ku, Tokyo, Japan.

FISHERY MOTION PICTURE

The following motion picture is available only from the source given in the listing.

SHRIMP STUFFED EGGPLANT

Shrimp Tips from New Orleans, a 16 mm. color film, produced and distributed by the U. S. Fish and Wildlife Service, especially designed for color or black-and-white television use, in which time-tested shrimp recipes are featured. The film, with its New Orleans setting, authentically portrays the culture, architecture, art, and music of that famous city, the strains of French cafe and modern Dixieland music lending additional atmosphere to the scenes. Preparation and serving of six recipes is woven colorfully into the 14-minute film. To borrow this film or obtain information about the sale of prints, write to the U. S. Fish and Wildlife Service, Washington 25, D. C.

Editorial Assistant--Ruth V. Keefe Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, Helen Joswick, and Helen Turner

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FISH AND WILDLIFE SERVICE HATCHERIES INCREASE TROUT PRODUCTION

Research and improved management techniques are paying big dividends in the production of trout at U. S. Fish and Wildlife Service hatcheries.

The 1955 output at all Fish and Wildlife Service hatcheries producing trout was 1,244,000 pounds, compared with 473,000 pounds in 1951. The Service operates 24 hatcheries which produce trout only and another 19 at which some trout are produced in addition to either salmon or warm-water fish. There are additional hatcheries for salmon only and others for warm-water fish only.

While some of the increase in trout poundage is due to enlarged facilities, rigid application of improved hatchery management techniques developed by research is the principal contributing factor. These research findings include knowledge of trout metabolism and improved diet and feeding practices developed at Fish and Wildlife Service laboratories. The full utilization of rearing space and the development and use of improved hatchery equipment also have been responsible for some of the gains.

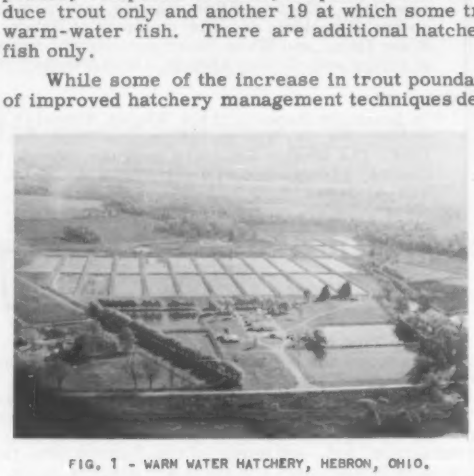

FIG. 1 - WARM WATER HATCHERY, HEBRON, OHIO.

At one hatchery there were two other factors which contributed to the tremendous increase in poundage. One of these is a heater which holds the hatchery water at the proper temperature during the winter months and makes it possible to transfer fingerlings instead of fry to the rearing ponds and lakes in the spring. The other is the utilization of the small natural lakes for rearing.

Heating units are now installed in two other hatcheries. The first such Fish and Wildlife Service project for artificially warming the hatchery water was at Spearfish, S. Dak. One of the objectives of trout propagation is to have the fish well into the fingerling stage by the time they are taken from the hatchery and placed in the rearing ponds. This gives them a chance to develop rapidly during the summer months, when water temperature is most suitable for rapid growth.

Trout eggs hatch and the young fish grow best in water between 50° and 60° F. The rule of thumb in trout propagation in relation to hatching time is "50 days at 50 degrees." In colder waters the hatching time is extended considerably.

Only a few years ago it was hoped that the average hatchery could produce one pound of trout per cubic foot of water. Now many Service hatcheries produce from 2 to 6 pounds per cubic foot of water. Some years ago it took 5 pounds of feed to produce a pound of trout. Now it takes 3.5 pounds, and in some instances less to produce a pound of trout. Per-man-production now may be as high as 15,000 or 18,000 pounds in one year at individual hatcheries, considerably higher than it was some years ago, but the average is about one-third of this.

FIG. 2 - TROUT PONDS AND HATCHERY BUILDINGS AT FISH CULTURAL STATION. THE PONDS ARE BEING CLEANED.

Larger hatcheries have proved to be more efficient than smaller ones. Many factors control the size of the hatchery, most important of which is the quality and quantity of the available water supply. While 50-degree water is ideal for trout hatching, the spawners do better in water somewhat cooler than that.

Trout hatcheries may be equipped with troughs or tanks for hatching and early rearing, and either ponds, concrete raceways, or small lakes for summer growth. Cold-storage space for about one-half of the year's supply of meats and other perishables and a fish-food preparation room equipped with proper slicers, grinders, and mixers are all part of a well-established hatchery.

CONTENTS (CONTINUED)

INT.-DUP. SEC., WASH., D.C. 15290

COLD STORAGE DESIGN AND REFRIGERATION EQUIPMENT

Fishery Leaflet 427 (Refrigeration of Fish - Part 1, "Cold Storage Design and Refrigeration Equipment") is one of a series of five leaflets on the refrigeration of fish recently released by the U. S. Fish and Wildlife Service.

The first section of this leaflet is concerned with design and construction of single and multistory cold-storage warehouses, the economics governing the type of construction and design selected, and that amount of technical data required for guidance of the processor in his choice.

PRODUCT STORAGE ON THE MEZZANINE FLOOR OF A REFRIGERATED WAREHOUSE. NOTE THE LOW PILING HEIGHTS.

The second section is concerned with refrigeration equipment. A resume of the equipment available and the respective advantages and disadvantages for specific tasks is given.

The third section develops the refrigeration requirement as affected by the type of load; the various freezing methods presently in use are then described and evaluated. Information on particular illustrative systems of freezing and of their respective freezing rates is presented.

In addition to this leaflet (Part 1), also available are Part 3, "Factors to be Considered in the Freezing and Cold Storage of Fishery Products"--Fishery Leaflet 429; Part 4, "Preparation, Freezing and Cold Storage of Fish, Shellfish, and Precooked Fishery Products"--Fishery Leaflet 430. Part 2, "Handling Fresh Fish"--Fishery Leaflet 428; and Part 5, "Distribution and Marketing of Fishery Products"--Fishery Leaflet 431. Copies of any or all of the leaflets issued in this series are obtainable free from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.